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No. IX. OF VOL. I., 1928. **No. 5453. Vol. CCXIV.** LONDON, SATURDAY, MARCH 3, 1928 Founded 1823. Registered as a Newspaper. Published Weekly. **Pp. 128—Price 1s.** Annual Subscription. Inland £2 2s. Abroad £2 10s.

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THE capacity of a human being to undertake feats of exertion and of endurance makes an appeal to different classes from varying angles. On the mechanical side there are anatomical and dynamical problems of absorbing interest. To the physiologist the subject is one of infinite possibilities for research, whether on the lines of neurology, of cardio-respiration, or the more subtle mysteries of biochemistry. To the clinician, inclined naturally to view the body less as a complexity of systems than as a medium for pathological opportunities, there is ever before him the possibility of strain or over-stress; and a solicitude, in the exercise of his profession, to utilise his authority in the prohibition of such activities as are likely to produce temporary or permanent injury. The average non-technical man is eager to dwell upon the remarkable capabilities of his body without any particular interest in the scientific principles comprised. He sees a machine which can propel itself unaided over the ground at the rate of nearly 25 miles an hour; which, represented by a Marathon runner, can progress for nearly three hours at the rate of ten miles an hour independently of fuel save that supplied by its own tissues and exhibiting no greater sign of injury than a few blisters on the feet—scratching off the paint of the machine; which, represented by a Channel swimmer, finds cold, hunger, and fatigue almost equally indifferent in comparison with the boredom of monotony. He sees a machine which is capable of feats of endurance not so exactly definable but more remarkable when exemplified by Arctic explorers, besieged garrisons, shipwrecked mariners, and the like. His interest in physiological research into his doings is strictly utilitarian. Can the physiologist discover something which will enable him to knock off a vital fifth of a second from his time on the track? Occasionally the physiologist thinks he can, as in the presidential address to the Physiological Section of the British Association in 1925, when Prof. A. V. Hill, in "The Physiological Basis of Athletic Records," was equally happy in his title and its interpretation.

It will be my task in this lecture to try to examine the subject inductively as a student of elementary physiology, and deductively as a student of clinical medicine. In any such inquiry—and this is by no means the first of its kind—it is generally evident that one or other qualification in the inquirer has dominated. An enthusiastic athlete may be reluctant to admit the existence of any fault or danger in a favourite exercise which the physician, unduly impressed perhaps by his acquaintance with disease, is too prone to expect or recognise. It may be a handicap sometimes to have more qualifications than one for judging a given subject.

In an appeal to authorities the conscientious inquirer into the effects of violent exercise is bewildered by discrepancies and contradictions. He learns from one source that exercise causes dilatation of the heart, from another that the heart is actually smaller after exercise than before. He is prepared for the information that the temperature of the body rises as the result of exertion, and yet he is alternatively informed that researches upon Marathon runners have shown that their temperatures were subnormal. No less an authority than Osler says that the blood pressure is greatly increased; a series of accurate observations by modern apparatus proves that it is lowered. The pathology of violent exercise is certified by the occurrence of albuminuria; physicians with special experience say that this is a negligible physiological circumstance. Such contradictions may well induce despair and impatience, until it is made clear that both sides are right, if only all the facts and circumstances are known.

I have no intention of demarcating the scope of my subject and defining where moderate exercise leaves off and violent exercise begins. An easy feat of exertion for one person may be reasonably regarded as moderate for another, and even described as violent for a third. I shall in general be dealing with exercise which approaches the limit of human possibility, and it is a necessary if arbitrary assumption that the human material in question is perfectly healthy.

THE CONSUMPTION OF OXYGEN.

Although oxygen is essential for the vitality of mammalian muscle, muscular contraction is anaerobic. It is pertinent to contrast the work of a muscle with that of a combustion engine. In the latter, oxidation precedes work; in a muscle, work precedes oxidation. The muscle may be regarded as a storage battery working on energy previously stored; and when exercise is over that energy has to be restored by the consumption of oxygen. The anaerobic contraction breaks down sugar into lactic acid, which has during the recovery process to be oxidised into carbon dioxide or converted into sugar and glycogen. The amount of oxygen consumed in the recovery process is a criterion of the degree of activity of the muscle; it is directly proportionate to the accumulated lactic acid. During rest the intake of oxygen is about 250 c.cm. per minute; during the most violent exercise a maximum of about 4 litres per minute may be consumed. In one isolated experiment an extreme consumption of 4·4 litres was observed. If the exercise taken is of such severity that the lactic acid produced by the muscles is no more than can be removed simultaneously by the influence of oxidation at the rate of 4 litres of oxygen per minute, fatigue will not occur until other factors of exhaustion enter into the problem. But when really violent exercise is taken the generation of lactic acid is enormously increased. For example, in the case of a sprinter running 100 yards in ten seconds, 40 g. of lactic acid accumulate in ten seconds, 1 g. for every stride taken, and this will require 6·7 litres for oxidation. The maximum oxygen intake during ten seconds is less than a litre, and most sprinters do not breathe at all throughout a 100 yards race, since immobilisation of the thorax is an aid to locomotion.

The 6·7 litres subsequently used for oxidation is what Prof. A. V. Hill aptly calls the "oxygen debt." When more prolonged exercise is taken, the oxygen used during respiration may, in this phraseology, be regarded as income; the oxygen debt run up is borrowed on the security of the lactic acid. So long as the security remains adequate, by so much may the expenditure of oxygen exceed income. The absolute limit, the largest oxygen debt possible in the case of the finest trained athlete, is 20 litres, corresponding to about 120 g. of lactic acid, which is an enormous saturation for a muscle to endure.

From these considerations it is fairly obvious that the natural capacity for athleticism depends upon a number of factors. A man may fail to be a good runner because his oxygen intake is small, or because his oxygen requirement is high, or because his credit as regards incurring an oxygen debt is poor. His oxygen requirement may be extravagant because his movements are wasteful, a fault which training may eradicate or reduce. It has even been shown by A. V. Hill that the impairment of movement occasioned by a blister on the foot causes a considerable increase in the oxygen requirement. His security as regards oxygen debt is partly constitutional and partly the result of training, for it depends on the capacity

* Delivered at the Royal College of Surgeons of England on Feb. 13th, 1928.

of the muscle to neutralise fatigue products or to tolerate their presence, and also upon the willingness of the individual to push himself to the degree of exhaustion. The subject of oxygen intake is not without its complexity, for it includes the factor of coefficient of utilisation, a problematical increased ability of certain muscles to take up oxygen from the blood. The essential feature, however, is the "minute volume" of the heart—i.e., the amount of blood circulating per minute. For an athlete to ensure the maximum oxygen intake of 4 litres per minute, a blood flow of 37·6 litres, or approximately 8 gallons, per minute is required. To produce this enormous volume two factors are involved—output per beat and frequency of the cardiac rate.

Cardiac Frequency.

At the beginning of exercise and, in fact, in anticipation of it, especially if there are emotional accompaniments, a simultaneous tuning-up of parts of the nervous system as a psychical process leads to increased frequency and depth of breathing, increased cardiac rate, and increased blood-supply to the body as a whole and particularly to the muscles and the brain. Acceleration of the heart at the beginning of exercise is mainly due to loss of vagal tone, and partly to an increase in accelerator tone. Loss of vagal tone is characteristic of shortening of diastole; stimulation of the accelerators influences systole as well as diastole. These initial changes provide increased oxygen before other mechanisms come into action. Continuance of increased cardiac frequency is in part determined by a continuance of impulses from the higher centres to the medullary centres, in part by the increase of adrenalin in the blood stream, in part by rise of temperature, and in part by increased venous pressure. The last was shown by Bainbridge to be the most important of all. Any rise of pressure in the auricles, or accumulation of blood in the great veins, leads to diastolic distension which reflexly decreases the tone of the vagus centre.

In the meantime, respiratory movements play their part in contributing to circulatory efficiency. The increased capacity of the thorax opens up the thin-walled veins, so that blood is aspirated towards them from the extrathoracic venous system and passes more readily from the right to the left heart. During expiration, compression of the veins expels blood into the left ventricle and so into the arteries. The respiratory movements clearly accelerate the blood flow and raise the arterial pressure. That there must be a considerable difference in the contractile power of the cardiac fibres, with a corresponding difference in the output per beat, is indicated by the observation that the maximum cardiac rate during exercise is much the same whatever the capacity for exertion. This maximum is generally accepted as 168 beats per minute, though I have noted a rate of 192 on a few occasions. With moderate exercise the comparatively untrained person can accelerate sufficiently to compensate for a relatively poor output per beat, but this adjustment is limited and distress is inevitable in extreme exertion. It is frequently forgotten that the rapid contractions of a vast number of muscles have an important accessory pumping action in pressing blood onward by the valves of the veins, an action which in Bainbridge's opinion may be equal to, or transcend in, importance that of the heart itself. This affords an explanation of the severity of rowing compared with running. In the former the movements of the body are not rapid enough to give this assistance to the heart.

Blood-supply of the Heart.

Exertion entails a large increase in consumption of oxygen by the heart's own muscle. It has been calculated that at least 125 c.cm. per minute may be consumed—half that required by the whole body at rest—so that the blood-supply to the heart must be one of the decisive factors which determine capacity for muscular work. Skeletal muscle can tolerate a considerable quantity of lactic acid in the absence of adequate oxygen, but this privilege of "running into debt" would clearly be highly dangerous for the heart, which must be protected against exhausting itself beyond recovery. Hence the heart's output at once diminishes when its oxygen-supply becomes inadequate, and it will be readily understood that a coronary blood-supply of the highest efficiency is imperative.

Dilatation of the Heart.

Much misconception exists on the nature of dilatation of the heart, and the ill-effects of violent exercise which it is supposed to reflect. Dilatation is a physiological process; it is an essential part of the mechanism by which the heart can increase or maintain its output. Starling's law of the heart postulates that the energy of contraction by which all muscle substance is always measured is a function of the length of the muscle-fibre. The greater the volume of the heart, within physiological limits, the greater the energy with which it contracts. The heart, then, dilates in order to increase its output in direct response to a larger venous inflow. Dilatation increases contractile power and so output per beat, and a comparatively slight dilatation enables the heart to empty itself completely at each beat. Yet, although the law of the heart is a constant, the actual contractile power of the heart must vary with the character of the fibre itself. A heart with musculature of superior contractility need not dilate under stress in an attempt to increase its contractile power to the same extent as one with inferior muscle. A thick-walled, compact heart with an increased number of fibres (to say nothing of a hypothetical superiority of material) must constitute a more efficient pump than a less well-developed heart. It is the failure to correlate these views with clinical observations which has led to discrepancies, contradictions, and entirely erroneous statements.

Size and Efficiency of the Heart.

The size of the heart is not so absolute as some observers would have one to suppose. It bears a relation to the age, stature, and build, and an apparently large heart may be normally commensurate with the general musculature of a well-developed man. Furthermore, the influence of such factors as alcoholism, in men accustomed to certain forms of exertion, has to be discounted. Secondly, the method of estimating size by percussion involves the personal factor too largely for absolute accuracy to be possible; and even in radiology the personal factor is not to be ignored, to say nothing of technical difficulties. That some dilatation of the heart occurs during exercise is certain; as we have seen, it is physiological. But to assert that permanent enlargement, whether pathological or not, occurs is another matter. Physiological dilatation disappears immediately upon the cessation of exercise, a fact on which depends the chief value of radioscopy in this investigation, and one which demonstrates the unreliability of evidence derived from percussion. To obtain the absolute size of the heart, tele-radiography under the best conditions is almost if not quite indispensable. Even so it is desirable to institute special refinements to be sure that, although no increase in the horizontal direction is observable, any antero-posterior increase may be detected. Of all the athletes I have examined with the skilled coöperation of Dr. H. Courtney Gage, not one has exhibited any suggestion of a heart larger than that proportionate to his height and build. In fact, the surprising feature is the impression that the heart is of less than average size. This supports the hypothesis that there is a variability in the quality of cardiac tissue, and unquestionably disposes of the long-held fallacy that violent exercise leads to permanent cardiac dilatation.

I have stated that there is very little difference in the cardiac frequency upon exertion between an athletic and a non-athletic heart. Some difference, however, may be noted in their deceleration on cessation of exercise, and this is of some interest as

suggesting a means of estimating cardiac efficiency. Its limitations are obvious; an untrained man cannot be subjected to prolonged exertion and, for reasons which I shall give later, I doubt if the usual exercise tests in the laboratory have much value. I regret that it has been impracticable to arrange to carry out on distinguished athletes the prolonged and numerous investigations which are necessary; isolated observations, especially on competitive occasions, are vitiated by psychical disturbances. With this apology I will now refer briefly to the results of personal experiments, conducted over a period of 14 years, and representing the averages of a very great number of observations.

A man accustomed to running can acquire a perfect automaticity of action, and so a fixed speed. Thus, I myself discovered that I could run for ten miles at a fixed rate of 6 minutes, 32 seconds per mile. Adopting this as a constant velocity, variations of the distance run gave a convenient estimate of the work performed. Such a proceeding has naturally an advantage over any mechanical exercise, such as running up and down stairs, stepping on and off a chair, lifting dumb-bells and so on, the circumstances and monotony of which prohibit prolonged research. Now, as one would expect, the maximum cardiac frequency, whatever the distance run, is not very variable. After 100 yards the heart is beating at 168; the resting rate is reached in a minute and a half after cessation. After 220 yards, the normal is reached in 2¼ minutes; after a quarter of a mile, in 20 minutes; after 5 miles not for 4½ hours, and after 10 miles as long as 6–9 hours may elapse. Although persistence of tachycardia is to some extent proportionate to the duration of the exertion, one conspicuous feature is that the initial deceleration is in all cases exceedingly rapid, and that the bulk of the time taken is occupied by the slow final stage after a relatively slow rate of frequency has been reached. Thus, even after ten miles, the rate had fallen from 192 to 120 in two minutes. Duration of exercise plays a larger part in prolonging the frequency than intensity of effort, for to run a furlong at full speed is, subjectively considered, as exhausting as five or even ten miles at the slow fixed rate. Yet the resting stage after the fast furlong is reached in 17 minutes. Persistence of cardiac frequency would appear to be due to inhibition of vagal tone, and is associated with increased metabolism.

Effort Syndrome.

It may be pertinent to consider whether the phenomena of prolonged cardiac frequency can be brought into line with those noted during the war in the so-called "soldier's heart," a term naturally intended to draw attention to factors inseparable from military life, and to suggest a sort of occupation disease. These symptoms are, however, familiar enough in civil life, and they were suitably included by Sir Thomas Lewis and those working under his direction in the general term "effort syndrome," describing the condition of an individual constitutionally ill-adapted to exertion. The more active circumstances of military life do not create the condition, but simply unmask it. The subject of effort syndrome has a greatly reduced capacity for exertion, and his inefficiency is demonstrated by the extent to which deceleration is prolonged, even after trivial exercise within the subject's self-accepted limit—e.g., doubling 100 yards slowly—when as long a time as 9½ minutes is required before the resting rate is reached. Hyperpnœa and vaso-motor instability are also very evident, and I am unable to agree that any definite evidence exists that the heart itself is the chief factor to be considered.

It is difficult to separate a constitutional defect from a disability amenable to treatment. I have seen from personal experience how half a dozen skilled investigators with a bias towards different ætiological possibilities unconsciously divert the questionaire of a patient with effort syndrome towards the particular cause they favour, whether it be psychic, toxic, rheumatic, endocrine, or exertion. If, as I believe, the condition is constitutional, it is again difficult to incriminate any one system. The subject may possess ill-developed coronary vessels, poor contractile power, or defective muscle-fibres. The inefficient athlete convicted of a yellow streak may be unfairly condemned; the yellow streaks may be in his heart muscle. Or an over-active cortex cerebri may fail to protect the heart from uneconomical over-activity. Or the fault may be biochemical, a disturbance of the normal relationship between the production of acid in the muscles and excitability of the respiratory centre. There may even be a more general disturbance of metabolism, and the equilibrium between the reaction of the red cells and that of the plasma may be upset. In diminished alkalinity of the blood less carbon dioxide is needed to excite the respiratory centre, so that hyperpnœa is easily produced.

I should be more convinced that shell shock and gassing might produce this condition had I been personally acquainted with men who, although previously possessing a good exercise tolerance, had exhibited effort syndrome after their ordeal. The sensation of being gassed, which I know from personal experience to be terrifying, may well disturb a hypersensitive medulla; similarly, trench fever may, according to one's predilections, be regarded as acting upon the myocardium or the vaso-motor centre. The cardiac muscle is, upon the authority of eminent cardiologists, very susceptible to bacteria and other toxins. Nevertheless, I doubt whether the temporary depression of activities in toxæmia is an indication that the heart is affected. I have always regarded the subjective sensations, asthenia, excessive perspiration, and so on as of vaso-motor origin. Were the heart directly affected, would not the influence of exercise upon the cardiac rate and recovery be manifest? On two occasions, when suffering from a toxæmia with pyrexia of 102°, I ran four miles; once with the hope that the infection might be aborted, once deliberately to see what would happen. The sense of exhaustion was considerable, but neither the cardiac rate at the termination of the exercise nor the prolongation of tachycardia varied in the slightest from observations made when the same exercise was taken under ordinary conditions of well-being. Graduated exercises produce improvement in some cases of effort syndrome, yet this does not appear to me a proof of training of the heart as such. The improvement which takes place may be a result of better coördination of the centres involved. I cannot regard the exercise tolerance test as any indication of the efficiency of the heart. It certainly has a distinct bearing upon capacity for exercise, but that is bound up with many other factors.

Respiration in Exercise and Second Wind.

At the beginning of exercise, and frequently in anticipation, the respiratory centre, in common with the other medullary centres, is psychically stimulated, so that the frequency and depth of breathing are increased. During exertion, both oxygen deficiency and increase in the hydrogen-ion concentration of the blood increase the activity of the respiratory centre; the oxygen deficiency increases the sensitivity of the centre to its specific stimulus, the hydrogen-ion concentration. Probably carbonic acid is a stimulant independently of its acid property when in solution. Rise in temperature, which may occur and which, in fact, must occur if the exercise is sufficiently intense and prolonged, also increases the responsiveness of the centre. The respiratory centre is called upon to ensure maximum ventilation of the lungs and to regulate the reaction of the blood.

A comparatively trivial change in the reaction of the blood may bring about a large increase in pulmonary ventilation, and it is suggested that this circumstance provides an explanation of the phenomenon "second wind." At a more or less fixed period in the course of exercise the sensation of acute breathlessness passes off, yet more rapid breathing is evident.

Nor is the change restricted to the respiratory side; in a well-marked case it seems as if a new supply of energy had been tapped. Pembrey and Cook concluded that the cause was cardiac, as a less frequent and more regular contraction of the heart occurs after the advent of second wind. Considered chemically, however, the characteristics of second wind are a fall in the alveolar tension of carbon dioxide and a decrease in pulmonary ventilation due to diminished hydrogen-ion concentration of the blood. This diminution can only mean a lowered production of acid in the active muscles or a more rapid oxidation, and this must imply a more perfect adjustment of all the coördinating factors which are essential for efficient violent exertion. By the time the athlete has got fairly into his stride, and all systems are working at their highest efficiency, second wind may be said to be established.

It will be understood why the phenomenon may be almost abrupt in one man and so gradual as to be imperceptible in another, according to the method of adjustment. It is because of the dramatic change in the first type that the term has arisen, but in the perfectly trained athlete it might be said that the "first wind" is never lost until general fatigue sets in. It is exceedingly difficult to count one's own respirations, for such attention is inimical to accurate observation. But so far as I have been able to ascertain during the course of a run, the respirations increase gradually to 30 per minute and then rapidly to about 54. Despite the polypnœa there is no sense of distress, but it is of course impossible to estimate the depth of the respirations.

Influence of Emotion.

The association of emotion with activity of the visceral sympathetic system is well known. Stimulation of the medullary centres concomitantly with stimulation of the muscles causes an increase in pulmonary ventilation, accelerates the cardiac rate and contractile force, and dilates the coronary vessels. This massive activity is bound up with increase of adrenalin, which, in addition to its so-called sympathetic action, stimulates the liver to turn out glycogen and so increase the available supply of circulating sugar. Glycosuria occurs during athletic activity, especially in connexion with emotional strain, and hypoglycæmia from adrenal exhaustion is seen in very prolonged feats of exertion. Contemplation of increased adrenal activity prepares us to understand how an emotional stimulus can call forth an unexpectedly great effort apparently beyond the athlete's powers, for instance the supreme final spurt of a man on the verge of collapse.

Blood Pressure.

Among the discrepant statements on the effect of exercise is that relating to blood pressure, and again the contradictions are explained when the circumstances of investigation are appreciated. It is interesting to refer to what is, perhaps, the earliest observation upon the subject. Dr. Mahomet, then pathologist to St. Mary's Hospital, stated after his investigations of Weston, the long-distance walker, that exercise might reduce or raise arterial tension. Reduction occurred, he said, if the subject was out of condition, and might produce syncope from cerebral anæmia. On the other hand, he explained a rise of arterial tension as due to irritation of the vasomotor nerves by an exhausted brain, and hence to contraction of the arterioles, or, alternatively, as due to capillary obstruction from impaired nutrition of tissues.

To determine the influence of exercise upon the blood pressure it is essential to make observations during the exercise, when it is found, as one would expect, that a rise is invariable. If observation is delayed until the termination of exercise, even if only a few seconds have elapsed, a fall below the resting rate will be detected. It is easy to see, therefore, how diametrically opposed statements have been made. The rise in blood pressure may be considerable without much concomitant increase in cardiac rate, as in lifting a heavy weight. A high arterial pressure is absolutely necessary for the efficient performance of muscular work. The rise is provision for ensuring a maximum supply of oxygen, as during exercise the flow of blood through the muscles may be six or eight times greater than at rest. Furthermore, the coronary blood flow depends essentially upon arterial pressure. The systolic rise is much greater than the diastolic rise, and an increase during exercise of 80 mm. is by no means unusual.

Increased arterial pressure is due not only to increased output of the heart, but also to constriction of the splanchnics and dilatation of the peripheral vessels. Splanchnic constriction is due to impulses which, arising in many ways, psychical and chemical, influence the vaso-motor centre, whilst arterial tone is lessened by metabolic products.

Immediately at the end of exercise the muscles relax instantaneously, the depleted veins of the abdomen and limbs take up the blood flowing from the capillaries, the heart is momentarily robbed of its supply, and there is a steep fall in arterial pressure. This fall may be responsible for a temporary giddiness and faintness, and so naturally susceptible to gloomy misinterpretation. The pressure remains reduced until the veins fill; this overflow feeds the heart, so raising the arterial pressure, which gradually falls to the pre-exercise level and often a little below it within three or four minutes. This is, of course, in striking contrast to the delayed reduction of the increased cardiac rate.

The athlete's resting blood pressure is distinctly low. Hence, whilst his arterial system is subjected to very considerable pressure for the limited period of exercise, there is compensatory reduction during his resting life. There appears to be no foundation for the statement that arterio-sclerosis—i.e., a degenerative change—occurs in the vessels as the result of much violent exercise. Certainly, so far as blood pressure estimations are valid, no evidence is forthcoming. When strain has been regarded as the determining factor of arterial changes, the part played by syphilis, alcohol, tobacco, and other toxins, as well as the natural quality of the arterial wall, has to be assessed. To see whether 27 years of exercise would show an effect upon the arterial system, a portion of my left radial artery was excised. The section has been submitted to Prof. Sir Edward Sharpey-Schafer, who reports that the details are indistinguishable from those of a radial artery of a healthy young man who has taken very little exercise.

Professors and directors of physical education in the American colleges are often prepared to judge the fitness of an athlete by his response to posture as indicated by alteration in his blood pressure and cardiac rate. When a very fit man rises from the horizontal position, acceleration of the cardiac rate should be trivial, a small rise of blood pressure is usual, and these two results may be correlated into a factor of physical efficiency. An increase of cardiac rate of less than four beats per minute and a rise of blood pressure of 10 mm. would be graded 100 per cent. A man with very poor vasomotor tone, either constitutional or after illness, will often show a fall in blood pressure and a considerable rise in cardiac frequency. My own investigations do not lead me to place any reliance on the test as an index of athletic efficiency, since there are many discrepancies. Above all, emotional factors produce most violent disturbances, vitiating any attempt at systematic investigation.

The Temperature in Exercise.

The efficiency of the body as a machine has been estimated by Benedict and Cathcart at 20 per cent. in an average untrained subject and 33 per cent. in one fully trained. A great deal of heat is inevitably produced which cannot be converted into mechanical work. To a certain extent heat ensures maximum

efficiency. A rise in temperature increases the excitability of the nervous system and especially, as I have mentioned, of the respiratory centre; it causes the secretion of more fluid from the synovial membrane and so smoother working of joints. In homely language, the engine does not work at its best until it is warmed up. Perhaps the most important consequence of raised temperature is the increase in the whole chain of chemical action involved in muscle metabolism. The velocity with which human hæmoglobin parts with its oxygen increases about fivefold for a rise of temperature of 10° C., the velocity with which it acquires oxygen being unaltered. During a distance race a rise of temperature of 7° F.—i.e., 4° C.—is not exceptional, so that the velocity with which oxyhæmoglobin can break down is doubled. One observer has stated that the temperature of Marathon runners actually falls, but his records were based upon mouth determinations which are valueless. Rectal temperatures show that a rise invariably accompanies exercise, the extent depending upon the external temperature, the humidity of the atmosphere, and, of course, the severity of the exercise. I have reason to believe that a substantial psychical rise may occur when there is competition.

A large number of personal observations show that the rectal temperature after a run of about nine miles is generally between 102° and 103° F. The highest temperature I ever noted was 105·8°, on a day when conditions were particularly unfavourable to heat loss. The temperature rapidly falls and reaches normal within two hours. There is clearly danger of hyperpyrexia in prolonged efforts under unfavourable conditions. It is the practice for the classical Marathon race to be run in one of the summer months and generally during the hottest hours of the day, a practice against which I have more than once warned the authorities. At the Olympic Games at Stockholm in 1912 a Portuguese competitor collapsed on the road and died of alleged sunstroke, which was probably heat-stroke. During the games at Paris in 1924, the 10,000 metres cross-country race was run on an insufferably hot, humid day without a breath of wind. Nearly all of the few competitors who finished were in a condition not only of collapse but also of mental distress and disorientation. When the Marathon race was held a few days later, there was fortunately a fall in the temperature with a cooling breeze, or fatalities might well have occurred.

Comparatively simple experiments show that there is no foundation for the idea that the pyrexia of exercise determines the persistent cardiac rate. Elaborate and thoroughly conclusive experiments will be found in an article by Martin and others in the *American Journal of Physiology*, 1914, xxxv., 211.

Changes in Blood and Urine.

During exercise on the level or at comparatively low altitudes increase in both red and white cells occurs, but above 2000 feet the increase is restricted to the leucocytes. Exercise causes the passage into the blood of a number of reserve red cells which lie dormant, and which, in consequence of splanchnic constriction by adrenalin, are dispersed to the periphery and so ensure a maximum supply of oxygen to the muscles. But at altitudes no such dispersal can occur; the perpetual demand for a maximum distribution of red cells to the periphery permits of no reserve. Leucocytes, however, increase in the peripheral blood at altitudes equally as on the level, because exercise squeezes lymph out of the muscles and drives it to the heart, and with it are carried the leucocytes gathered from the tissues. The altered distribution of the red cells, at first determined by splanchnic constriction, is continued when perspiration sets in, for this produces increased density of the blood and so increased oxygen-carrying capacity for unit volume. The advantage of free perspiration thus acquires an additional significance, apart from the avoidance of over-heating and the lowering of peripheral resistance.

Apart from the question of albuminuria, which has acquired a special importance, the investigation of nitrogen metabolism in exercise has received little attention from modern workers. The feats of Weston, the long-distance walker, in the year 1870 supplied an opportunity to contemporary physiologists, who exhaustively analysed his diet and excreta for many weeks. In this connexion must be mentioned such classic names as Austin Flint in America and Pavy in this country. The conclusion ultimately derived—that non-nitrogenous food is the source of muscular energy—is now of historical interest, since observation of the respiratory quotient shows that the energy expended by muscles must ultimately be derived from fat and carbohydrate, with a preferential utilisation of the latter.

There is, as Ryffel has shown, an increase of lactic acid in the urine after exercise. There is also an increase in phosphoric acid, which apparently plays some special rôle in the breakdown and restoration of glycogen in muscle, and it has been stated, though I have been unable to confirm this, that the muscular output of a trained man is considerably increased by an ingestion of phosphates. The Germans administered phosphate of sodium in large doses to their "storm troops."

I have frequently found an increase in oxalates after an intense effort, though whether the metabolic activity is of nervous or intestinal origin I am unable to say.

There is sometimes a transient (physiological) glycosuria after exercise. The enormous increase in adrenalin in the circulation explains a temporary hyperglycæmia with glycosuria; the subsequent adrenal exhaustion, which may occur in protracted efforts, would be responsible for the hypoglycæmia which has been described in Marathon runners. When the existence of hypoglycæmia was first demonstrated by insulin, I ventured to speculate that the symptoms of distress from exertion might find their explanation in hypoglycæmia. Levine and his fellow-workers in America have shown that hypoglycæmia occurred in Marathon runners who exhibited exhaustion, which is usual between the fourteenth and eighteenth miles. They correlated the degree of distress with reduction in blood-sugar, and in subsequent observations upon the same runners they prevented distress by the administration of sugar before and during the race. Although it is unlikely that hypoglycæmia can be directly responsible for fatigue, save in very prolonged feats of exertion, nevertheless the part played by carbohydrates encourages their ingestion at a suitable period before the effort. It is interesting that the modern conception of carbohydrate metabolism has endorsed this long-standing empirical practice of athletes.

Deaths from Exertion.

Excluding hyperpyrexia, it is significant that the majority of sudden deaths associated with some feat of exertion are on the golf links, and their subjects elderly and plethoric with degenerate arteries. In the rare instances when a young and presumably healthy athlete has succumbed, there has been too ready a tendency to assume the influence of exertion, and post-mortem inquiry has rarely been undertaken. Last summer a verdict of heart strain was returned in the case of a young man who fell fainting from an eight at Henley and was found dead on removal from the water. I made all possible inquiries, and the doctor who had been called was kind enough to send me the fullest details. There had been, in fact, no antecedent exertion, as the boat had only just left the landing-stage. No autopsy had been performed, but from the doctor's description of the body it seems almost certain that status lymphaticus was responsible.

Prejudice must inevitably play a part in deciding whether or not any permanent alteration in the heart can result from one extreme feat of exertion or from a long-continued athletic career. Some observers regard any circulatory disability as being

attributable to exercise, and do not realise that exercise has revealed a latent organic defect in a heart hitherto regarded as sound. In an article in 1870 the medical officer to Rugby School, deprecating running on account of the strain thrown on the circulation, noted that "the recent death of England's greatest sprinter from aortic aneurysm is significant." So it is, but not exactly in the way he meant!

Sir Clifford Allbutt suggested the term "overstress" in preference to "overstrain," since any strain is overstrain. The behaviour of a healthy heart under great stress bears no resemblance to cardiac failure—dilatation, cyanosis, venous engorgement, enlarged liver, œdema—so that failure of ventricular muscle cannot be responsible. I have already indicated the fallacies relating to recognition and estimation of enlargement of the heart; auscultatory peculiarities, sometimes demonstrated, often occur under normal conditions. When one recalls the symptoms described by nervous people with perfectly healthy hearts one realises that subjective sensations are valueless. Such factors as chronic infections, dyspepsia, insufficient sleep, and puberty with its inherent nervous instability, are likely to be overlooked in adolescents and ill-effects from violent exercise are too often assumed. This is not to say that overstress leading to permanent strain is impossible, though the exact method of its production may be problematical and its detection may be beyond our capacity. There may be an alteration in the molecular state of the fibres of the cardiac muscle, some subtle change resulting in lessened contractile power. This is all hypothetical. There is no evidence that any such effect ever occurs, and I prefer to visualise overstress, and perhaps strain, if it occurs, as a far more general condition. A healthy and powerful heart is a sine quâ non to a would-be athlete, but the feature which distinguishes the athletic man from the non-athletic is the equilibration of all the factors concerned—heart, lungs, muscles, and skin, as well as his biochemical machinery. If overstress really occurs it lies in a general disturbance of this fine equilibrium. Sir James Mackenzie had "personally never seen such a thing as a strained heart." Sir Thomas Lewis expresses the same view. He says that the circulatory organs are built to stand the strains which they themselves create; their reserve is often underestimated. When the call is excessive, it is the full supply of blood to the muscles which will fail and not the heart. Dr. G. A. Sutherland points out that certain alleged cases of strain are really organically damaged hearts, unrecognised until the breakdown, whilst others are instances of natural peculiarities mistaken for pathological conditions. Cabot, in a classification of groups of heart disease, remarks that, had any of them occurred in athletes or ex-athletes, they would have been called athlete's heart.

Exercise and the Lungs.

Very little attention has been paid to the possible deleterious influence of exercise upon the lungs. From time to time the death from pneumonia of a young man with an outstanding aquatic record has stimulated the gloomy forebodings of those who are convinced that even one severely contested boat race may lead to pulmonary weakness and greater susceptibility to infection. From time to time the development of pulmonary tuberculosis in a brilliant young athlete affords sufficient proof to those disposed to deprecate violent exercise. I venture to put forward the possibility of a direct relationship between the tuberculous diathesis and athletic ability, although it is very difficult, if not impossible, to prove that the tuberculo-toxin may confer a flair for athletics. In my own experience, two famous middle-distance runners have phthisis, and a third was compelled to leave this country to reside in South Africa a year after terminating an exceptional athletic career. That violent exertion contributes to the progress of a lesion is a reasonable charge, although it is at least arguable that the exercise may operate in the opposite direction. The instances of pneumonia are too isolated to exclude coincidence. On such a line of reasoning, exercise might be held responsible for any concomitant occurrence, good or bad. The oarsman is usually tall, and tall men are less resistant to diseases of the lungs than men of more compact build. The after-histories of men who rowed in the boat race show that the participants have a better life expectation than the average. Morgan's book, "University Oars," was published in 1873 as a counter-claim to Skey's letter to the *Times* in 1867. Morgan undertook an exhaustive inquiry into the past and present health of the men who had rowed in the 40 preceding boat races. Meylan studied the after-histories of the Harvard oarsmen who rowed from 1852 to 1892. Both his and Morgan's figures showed an increased life expectation of five years over the insured group, which is a selected risk. Such figures are convincing, but the material investigated is exceptional, and it may be contended that their life expectation might have been even longer if they had not rowed. They serve at least to show that there is no indication of an adverse effect. Dr. Bradford Hall has recently published statistics of the longevity of cricketers.

Organs of Digestion and Kidneys.

The influence of exercise upon the organs of digestion is to a considerable extent beneficial. The general stimulation of metabolism, the increased elimination of waste products, not to mention the habitual psychic associations, are, as a rule, favourable to appetite and digestion. Yet digestive disturbances among the athletic are far from infrequent. Indigestion is one cause of "stitch," but this is a disability with many possibilities. There is to this day some survival of traditional absurdities about diet in training. Such a cause for dyspepsia can, of course, be avoided, as can the disadvantage, not to say the danger, of undertaking violent exercise soon after a heavy meal. If the fairly widespread belief that appendicitis and duodenal ulcer are relatively more frequent in athletic young men is true, it is not difficult to predicate plausible reasons. The powerful contractions of abdominal muscles thrust the viscera down into the pelvis, and from mechanical difficulties the ileum becomes unnaturally full and sags. Traction on the duodeno-jejunal junction causes duodenal distension and, subsequently, yielding in the first (relatively mobile) part, with a tendency to give way on the convex surface—the commonest situation for an ulcer.

The tendency for violent exercise to produce albuminuria has naturally been regarded as a serious disadvantage and an indication to prohibit exercise to predisposed persons. In his contribution to the *Transactions* of the Medical Society of London (vol. xxx., p. 18) Dr. Collier, of Oxford, expressed the opinion that albuminuria should no longer be regarded as a cause for pessimism and a reason for limiting the subject's activities. Was it not, he asked, a vascular occurrence in a comparatively labile system? To do full justice to Dr. Collier's contribution one should remember that the bare occurrence of albuminuria had previously been regarded as evidence of renal disease. I have been struck by the comparison of my own observations with those of Dr. Collier and Dr. Lemprière and others with exceptional opportunities for investigating athletes. Dr. Collier invariably found albuminuria in oarsmen after a hard row; Dr. Lemprière found it in schoolboys after even comparatively short runs. Working, as I have, among seasoned track athletes undertaking the most extreme exertions, I have seldom found abnormal urinary constituents. I believe that in rowing the mechanical side of the exercise conduces to congestion and pressure upon the prostate and vesiculæ seminales, with the subsequent appearance of their secretions in the urine. Moreover, the age and relatively labile vasomotor system of many oarsmen and all schoolboys bring their post-exercise albuminuria into line with postural and cyclical albuminuria. I have in several instances found that

the albumin was precipitated by dilute acetic acid in the cold.

After very violent exercise a few casts are generally found, but as they are transitory any renal alteration must be trivial. Nothing short of a vigorous 5 mile run produces casts in my own urine, and none is present six hours after the effort. A professional pedestrian, aged 51, after a successful attempt upon the world's record for an hour's walk, passed granular casts for 12 hours only. An Olympic champion, aged 23½, after running half a mile inside world's record time, passed urine which contained only the faintest trace of albumin and no casts. I select these as two athletic feats of exceptional severity; it is clear that renal changes due to the most violent exercise are ephemeral only.

The Nervous System.

I have more than once indicated that the 'seventies were particularly intrigued by the evils of athletics, the serious possibilities of which extended even to insanity. In a medical journal of 1870 I have discovered a long account of the influence of exercise upon a university oar, who, trying to combine his athletic career with an attempt to overtake academic arrears, became mentally deranged. I cull the following from a paper in 1876: "If any psychologist will take the trouble to trace out the history of each of our eminent pedestrians, he will discover that a very large proportion of them have been subject to some sort of madness." At the present day the worst we can say about the nervous side of the athlete is that he is neurotic, and we do not necessarily maintain that his neurosis is the effect of exertion; but rather that it is the outcome of competition, anxiety, public adulation, and the like. The athlete preparing for a really important contest thinks of little else throughout the whole of his waking hours. The strain imposed upon prominent lawn tennis players engaged in competition for the greater part of the year may well lead to a nervous condition which is only indirectly related to the physical exertion. The continuous overflow of nervous impulses to the muscles, the complex processes involved in coördinating skilled movements and in focusing attention, together with such mental factors as excitement, apprehension, anxiety, and judgment, must involve a considerable expenditure of nervous energy during competitive physical exercise. This applies with greater force to young women and girls participating in tournament play and track athletics. Their more delicately organised nervous system and greater disposition to psychical disturbances, not to mention the diversion of energy from channels for which it is specially required, are factors conducive to overstress. Excluding feats of endurance, for which a relative phlegmatism and stolidity are desirable, the athletic temperament approximates to what is popularly termed the "highly strung," and the athlete is generally "vago-tonic."

The literature of physical exercise in its physiological and pathological aspects is a great deal more voluminous than is generally recognised. For many important contributions we are indebted to American physicians, who enjoy special opportunities for research upon the athletes in their numerous colleges and universities. On the Continent, and particularly in Austria, systematic investigations on the cardiological side have been performed with a thoroughness which experience of Teutonic discipline prepares us to expect. But to select only a few outstanding names, Leonard Hill, A. V. Hill, Pembrey, Barcroft, Haldane, and Douglas have contributed results in this country as important as any of those of their transatlantic and continental colleagues. Above all, I feel that a special expression of appreciation is due to the late Prof. Bainbridge. I read his work, "The Physiology of Muscular Exercise," on its appearance in 1919, but a full appreciation is possible only by a re-perusal after a fairly comprehensive survey of the general literature. To Prof. A. V. Hill I am personally indebted for much generous assistance in elucidating several points.

An Address
ON
POST-OPERATIVE SEPSIS
IN GENERAL AND PUERPERAL SEPSIS IN PARTICULAR.

Delivered at the New Zealand Medical Association Meeting at Hamilton, N.Z., February, 1928,

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When an operation "goes septic," the organisms causing the mischief are derived from one of two sources. Either they come from outside the patient's body or they are resident on or in the patient's body at the time of the operation. We describe the first of these happenings as infection from an extrinsic source, or more shortly, extrinsic infection; and we describe the second as infection from an intrinsic source, or intrinsic infection. For extrinsic infection to occur conveyance is a necessity, and the possible agents of this are the hands of the operator or his assistants, their saliva, their sweat or their hair, the instruments used, the ligatures and sutures inserted, the swabs, sheets or dressings applied, or even the dust of the room or theatre in which the operation takes place. For intrinsic infection to occur conveyance is not a necessity if the septic organisms are resident on the part actually operated upon, but it is a necessity when the part operated upon is initially aseptic and the organisms come from some other area of the body. The possible agents of conveyance in this event not only include the hands of the operator and his assistants, but also the blood stream and lymphatic stream of the patient, and all other currents and flows in his or her body which are capable of transporting bacteria. The problem of obtaining surgical asepsis, both during and after an operation, therefore, resolves itself into (1) obtaining initial sterility in the area operated on, and (2) preventing conveyance to the area of organisms potential for sepsis from elsewhere.

Initial Sterility.

Bacteria are normally resident over all the outer surface and most of the inner surface of the human body, the areas which are an exception to this rule being the interior of the uterus and the urinary tract down to the urethra, and probably also the biliary and pancreatic ducts and the smaller bronchi and pulmonary alveoli. The distribution of the bacteria is, however, very variable as regards their quality, for the organisms found on the skin are generally of low potential virulence except in certain areas, whilst those resident in the alimentary tract are of much greater potentiality for harm, especially in certain parts of it.

The same variation is observable in quantity. Thus the skin of the arms, chest, and upper abdomen contain few, as compared with the pubes; the fork and the inner sides of the thighs, and the stomach and jejunum few as compared with the mouth, colon, and rectum. Of all areas the lower bowel is normally most dangerous, not only because it is the most heavily infected, but because the organisms it contains are mostly of considerable potential virulence. It is obvious from the results which follow traumatic perforation of the gut, or bruising or strangulation of its wall, that even in the most healthy person the bowel organisms, far from being easily tolerated by the tissues in their immediate neighbourhood, are, in fact, held within bounds by a fence of tissue resistance so delicate that the least injury to it is followed by a dangerous invasion. Around the anus there exists a zone of skin whose bacterial content becomes more and more identical with that of the

lower bowel as the anus is approached. This can be proved by making cultures, but common observation shows it. If a game bird or hare is hung it is the fork, the inner and upper thigh that first becomes "high," and every surgeon knows that incision fringing on this area, such as the inner end of that for inguinal hernia, or the lower end of a subumbilical median incision, are points favoured by suppuration. This was strikingly exhibited in war wounds, as all who had charge of wounded men remember. The nearer to the anus, the greater the probability of grave infection.

The difficulty, therefore, of procuring initial sterility of an area to be operated upon varies very much, according to the anatomical position of that area. Skin can be sterilised by certain antiseptics, though the antiseptic must be applied for a far longer period than is usually deemed necessary; the average preparation of the skin for an operation, at most, achieves but a temporary surface sterility. As, however, the skin organisms are usually of very low potential virulence, this does not much matter, except in areas like the perianal zone, where it may matter a great deal.

The problem of procuring initial sterility of the inner surface of the body, as compared with its outer surface, the skin, is at present practically unsolved. No means are known at present of sterilising the interior of the bowel, or of the mouth, or of the nasopharynx or nose, short of applying antiseptics in such concentration that they kill the surface they are applied to. The vagina is in a rather better case, for if it is not too heavily infected its surface can, I believe, be sterilised.

Preventing Conveyance.

Septic organisms are conveyed either by extraneous agency or by natural agency. Under the term "extraneous agency" falls all conveyance by the surgeon and his assistants, and also conveyance by dust, but fortunately this method of transportation must be very rare, for if not, surgery would be impossible. Experiments carried out by Andrews on the germ-content of the air of Oxford-street, in London, showed that pathological organisms were practically absent.

Under the term "natural agency" falls conveyance by the blood stream, the lymphatic stream, and all other natural flows capable of transporting organisms from one part of the body to another. Take, for example, a traumatic hæmatoma of a deep-seated muscle which presently suppurates. The muscle was almost certainly sterile at the time of injury, so that the organisms of suppuration must have been transported into the injured area from elsewhere, probably by the blood stream. Again, the organisms in a suppurating hæmatocele due to extra-uterine gestation probably come from the intestine by lymphatic transudation through its wall. Bond and others have shown that microscopical particles of indigo and carmine placed in the upper vagina are transported into the uterine cavity and even into the tubes by a current which apparently works along the walls of the canal in the reverse direction to the general flow.

The problem of preventing the conveyance of bacteria from extrinsic sources to the operation area is solved by the absolute sterilisation of all instruments, appliances, and material used at the operation, by the wearing of sterile gloves, masks, and gowns by the surgeon and his assistants, and by the observance of the recognised aseptic ritual of an operating theatre, which forbids anything already sterilised being brought into contact with any object not sterilised.

On the other hand, the problem of preventing the conveyance of bacteria from intrinsic sources to the operation area is very far from being solved. In certain operations a part of the area to be operated on can be made sterile to start with, while other parts cannot, as, for instance, in resection of the bowel, where the abdominal wall can be made sterile but the intestine cannot. To prevent transportation of organisms from the bowel to the abdominal wound, the latter is elaborately shielded by sterile cloths or rubber. But even with such precautions the possibility of extraneous conveyance is only partially met, for bacteria may be, and probably always are, conveyed from the interior of the bowel on to the peritoneum immediately adjacent to the line of intestinal suture. Fortunately dosage counts in infection; that is to say, the tissues themselves can deal with bacteria transported on to them, provided the number implanted be relatively small. The factor of tissue resistance comes into play as well as the essential virulence of the organisms, and this not only varies immensely in different individuals, but depends on the treatment the tissues have received during the operation. Bruised, ecchymotic, half-strangled, and mauled-about tissue is much less resistant to bacterial assault than tissue that is uninjured.

The part of the problem, however, that at present almost baffles us is to prevent the transport of organisms from intrinsic sources on to the operation area by the natural agency of the currents and flows existing in the living body. For instance, we have not, nor, probably, shall we ever have, any means of preventing organisms transuding through the bowel wall into a pelvic hæmatocele, nor of preventing bacteria in the upper vagina ascending into the uterus. The dilemma has to be got over in other ways, first by seeing to it that the organisms resident in the patient's body, not only in the operation area but in all other areas, are of as low a potential virulence as possible, for then their transportation does not matter so much; and, secondly, since virulence is entirely relative to tissue resistance, by increasing tissue resistance or, at least, being careful not to lower it by unnecessary trauma. Tissues damaged to the degree of partial devitalisation may possibly have an actual attractive effect on bacteria. Another possibility is that transportation of organisms is always going on in the body fluids, but in such minute quantities that effects are only produced when there is some marked local lowering of resistance. Whichever be the explanation, it is certain that they increase enormously in damaged tissue, not only in number, but in virulence.

The modern surgeon therefore prefers, if there is time, to abolish from the patient's body before the operation all harbourages of obvious sepsis, such as foul teeth and unhealthy tonsils, whilst he carefully avoids in the performance of the operation rough-handling and tearing and all other force that unnecessarily bruises the tissue. As a result of the ever-increasing application of the principles I have summarised, the surgical results of to-day have very markedly improved on what they were 20 years ago, and they will continue to improve with every addition to our technique that makes for more perfect sterilisation of the operation area to begin with, greater certainty of preventing the conveyance to it of organisms during and after an operation, and increased delicacy in the handling of the tissues.

On Puerperal Sepsis in Particular.

The reason why I have begun this address with a dissertation on surgical asepsis in general is that childbirth is the operation whereby the neoplasm of pregnancy is removed, and puerperal sepsis is the condition produced by septic infection of the operation area.

The operation may be performed: (1) by the woman alone; (2) by the woman and obstetric surgeon in coöperation; and (3) by the obstetric surgeon alone. The first of these we call natural delivery, the second assisted delivery, and the third artificial delivery. Having then examined the mechanism of post-operative sepsis as it applies to all operations, let us see how it applies in particular to the operations that collectively come under the head of childbirth, remembering that sepsis follows an operation because either (*a*) the

operation area was not initially sterile; or (*b*) infection from an extrinsic source occurred during or after the operation by extraneous agency; or (*c*) infection from an intrinsic source occurred during or after the operation by extraneous agency; or (*d*) infection from an intrinsic source occurred during or after the operation by natural agency.

Natural Delivery.

When Nature operates her instrument is the uterus itself, and this works in an area that is normally sterile. The possibilities of infection from an extrinsic source, or from an intrinsic source by extraneous agency, do not therefore exist. When sepsis follows labour, during and after which no interference has taken place, either the uterus was initially septic or septic organisms have been transferred to it by natural agency from the vagina or elsewhere. Initial sepsis of the uterus is probably extremely rare, but one occasionally sees cases of puerperal fever in which pyrexia was noted even before the onset of labour. That the uterus might become infected from an intrinsic source by natural agency before labour began must be allowed, when we consider infections like acute osteomyelitis and other analogous conditions which are almost certainly conveyed by the blood stream. Infection from the vagina, on the other hand, is much more likely, considering the proved fact that microscopic particles from the upper part of that canal can be transferred by natural agency into the uterine cavity. Indeed, it is probable that such transference always occurs, but because the number of bacteria so transferred is small, and the bacteria themselves are of low potentiality, they perish under the bactericidal effect of the blood and serum exuding from the uterus. On occasion, however, the vagina may contain bacteria of high virulence, and then such transference would be liable to lead to grave results.

The organism commonly responsible for puerperal fever is a streptococcus, usually of the hæmolytic group, and often identical with *S. pyogenes*. Since streptococcal vaginitis is a very common complaint, and streptococci can often be isolated from the vagina without any sign of inflammation being present, the fact that absolutely natural labour can be followed by sepsis need occasion no surprise. That it occurs relatively so seldom must, I submit, be due to the small number of organisms capable of being conveyed into the uterus by natural agency and their usual low virulence.

Assisted Delivery.

When the woman and the obstetric surgeon coöperate, the possibility of infection by extraneous agency, both from extrinsic and from intrinsic sources, becomes added to infection from intrinsic sources by natural agency. We should expect, therefore, on purely logical grounds, that assisted labour would show a higher sepsis rate than natural labour, and in fact it does, in spite of modern preventive measures.

Until quite recently extrinsic infection was held to be the usual cause of puerperal fever, in spite of the fact that the measures taken against it so successfully in other forms of surgery, such as the use of antiseptics and the wearing of gloves and sterile gowns, have been generally employed in midwifery for a good many years without greatly diminishing the total number of cases, though they have sufficed almost to abolish the epidemics which were frequent in lying-in hospitals and which occurred from time to time in the practice of individual obstetricians. The fact is that most puerperal sepsis is made up of sporadic cases bearing no relation to one another, and the relatively poor results obtained by measures directed simply against the occurrence of extrinsic infection, as compared with their striking results for epidemics, necessarily suggests that the ordinary sporadic, unlike the epidemic, case is not due, as a rule, to extrinsic infection at all, but to intrinsic infection.

The entrance to the vagina lies in a skin zone over which intestinal organisms are more or less thickly spread, and these organisms, even in the most healthy person, are potential for sepsis. The bacterial content of the lower bowel represents the drainings from the whole of the alimentary canal, including the mouth, teeth, tonsils, pharynx, and appendix, so that in infective conditions of any of these the causative organisms are swallowed and presently attain the lower bowel and hence the skin in the neighbourhood of the vagina and vulva.

In assisted labour the vagina forms, as a rule, the main field of the operation, so that the surgeon not only has to work through and in an area which may initially contain organisms of potential virulence, but one to which the approaches are always more or less heavily infected. Therefore, even if he succeed in procuring asepsis of the vagina to begin with, he is still faced with the difficult problem of preventing infection during the operation by the manual carriage of organisms from its approaches. The greatest danger lies in introducing hands or instruments into the uterus, for then septic organisms can be implanted directly on the placental site, but even if they be carried merely as far as the upper vagina, a risk remains that they may be transported into the uterus by the natural mechanism.

The much greater frequency of tissue damage in assisted, as compared with natural, labour is another factor which deserves close consideration. Tears of the cervix, vagina, and perineum occur in natural labour, but with much less frequency than in assisted labour. Nor, on the average, are the tissues in their neighbourhood nearly so much bruised and devitalised, because they are not subjected to so much force. Severe tissue damage, because it forms a good nidus for the growth of organisms, is always dangerous, and is most especially so when the upper vagina and cervix are involved.

Artificial Delivery.

Two operations fall under this head, accouchement forcé and Cæsarean section.

In accouchement forcé the neoplasm of pregnancy is taken away through the vagina by the surgeon unaided, exactly as a submucous fibroid might be removed. The operation is not only a very severe one, involving great tissue damage, but it is carried out in an area which it is difficult to sterilise initially and very difficult to protect against the manual carriage into it of organisms from its heavily infected approaches. Practical experience bears out logic, for this is of all forms of delivery the most often followed by severe septic infection, and this would be the more apparent were it not that a large proportion of the patients operated on die by shock or hæmorrhage before sepsis has had time to develop.

There is another method of rapidly emptying the uterus called vaginal Cæsarean section, in which the cervix and lower uterine segment are deliberately incised from below, and sutured up afterwards. It is a difficult operation, only performed by practised obstetric surgeons, and it is less liable to be followed by sepsis than the classical accouchement forcé. There would appear to be two reasons for this. First, since it is carried out in operating theatres only and by very expert surgeons, the antiseptic technique employed is probably superior to that of accouchement forcé, which is usually performed under bad conditions. Secondly, the tissue damage inflicted is much less severe, clean-cut wounds replacing the bruised lacerations which the older operation necessitates.

In Cæsarean section by "election," which is performed either before or just after labour has begun, the vagina is shut out from the operative field, and as the uterine cavity is normally sterile and the abdominal skin can be rendered sterile or cut out of the operative field altogether, the surgeon works in what, from the point of view of asepsis, is an ideal area. The risk of extrinsic infection is deleted by the aseptic ritual of an operating theatre, whilst

the possibility of intrinsic infection by extraneous agency is rendered practically non-existent by the preparation and draping of the abdominal skin, so that only intrinsic infection by natural agency is left unguarded against. Though it is possible, after Cæsarean section, for organisms in the upper vagina to ascend spontaneously into the uterus and infect both the sutured wound and the placental site, the event is an uncommon one, and post-operative sepsis, which occurs after an operation performed with all the proper safeguards, is usually due to organisms finding their way across the peritoneal cavity from the intestine to the sutured uterine wound. This is analogous to what takes place when a hæmatocele becomes infected, and is probably brought about either by oozing from the uterine wound after the operation is finished, or by the partial strangulation of part of the uterine wall by ill-placed sutures. When such a misfortune occurs, the symptoms are those of a local inflammation of the uterine wound. Placental site infection giving rise to the symptoms of typical "puerperal fever" is very rare indeed.

When, however, the operation is performed after the cervix is open to the vagina the case is very different. We will call this Cæsarean section by "compulsion," since, on account of the considerable risk of post-operative sepsis that accompanies it, it is not performed unless the surgeon is compelled. This sepsis might be expected for far more menacing routes of infection exist in addition to those possible in the "operation of election." It was shown by Routh, from actual figures, that the risk of sepsis after Cæsarean section increases progressively with the time over which the uterine and vaginal cavities have been in continuity, and depends still more upon the amount of intravaginal manipulation that has been practised beforehand. This is the experience of all surgeons. The open cervix no doubt makes spontaneous organismal ascent more easy, and allows the head of the child to be fouled, so that it infects the uterine cavity as it is pulled up. The time factor would merely operate by increasing the period over which organisms might spontaneously ascend, but the ill-effects of previous manipulation and instrumentation can only be due to the carriage of organisms from the perivulval and perianal skin into the vagina and cervix. No matter how carefully the surgeon who carries them out is gloved and gowned, the danger is at the best only partly abrogated. It is the most striking proof we have of the reality of intrinsic infection by extraneous agency, and makes clear the reason why assisted labour is more likely to be followed by sepsis than natural labour.

SUMMARY.

Typical puerperal fever is least common after absolutely uninterfered-with labour and after Cæsarean section by election, in both of which the only risk that cannot be guarded against is intrinsic infection by natural agency. It is commoner after assisted labour, because an additional risk, which cannot easily be guarded against, is added—namely, the risk of intrinsic infection by extraneous agency. This is rendered more serious by the tissue damage, often severe, that is inflicted by the operation. It is commoner still after Cæsarean section by compulsion, because the uterus is directly infected as the child's head is pulled up, and is commonest after accouchement forcé, because severe tissue damage is invariably inflicted and the uterus is directly infected as well.

CONCLUSIONS.

The first conclusion to be drawn from the facts we have considered is that in obstetric, as in general, surgery there is no royal road to the abolition of post-operative sepsis. The routes and modes of infection are too many and too complicated to be countered by a single method of prevention. The organism commonly responsible for puerperal fever is a streptococcus, and it is, I think, generally admitted that pregnancy lowers the body resistance to this organism in a special degree. The streptococci found in puerperal fever have been closely studied in the endeavour to trace their place of origin, but no consensus of opinion has been reached, nor is it of primary importance. The killing of all streptococci and other organisms of sepsis, both local to the patient and local to the surgeon, is obviously the grand ideal, but its achievement is beyond our powers at present. The main harbours of sepsis, however, are known to us and must be attacked; the routes and modes of infection which I have described can to a large extent be stopped up or countered, whilst tissue resistance must be exalted if a method can be found, and in the meantime preserved at its highest possible level by avoiding all unnecessary tissue damage.

Of the five operations by which the neoplasms of pregnancy may be removed, natural uninterfered-with delivery is the one most desirable, for although Cæsarean section by election is no more likely to be followed by sepsis, it has certain other drawbacks and risks. Unfortunately, Nature's operation is inefficient for a certain number of cases, and assisted delivery has to take its place, in spite of the fact that its sepsis rate is a higher one. It should not therefore be resorted to until it is quite clear that the uterus is unequal to its task, and the surgeon must take every possible precaution to abrogate the risks that his entry on the operative field entails. This can only be achieved by an antiseptic technique far more thorough than that commonly employed. The wearing of sterile gloves, gowns, and the use of antiseptic lotions are measures most efficient against extrinsic infection, but so long as a single organism remains unkilled in the vagina, or unkilled or uncovered in the skin surrounding the entrance to the vagina, the risk of intrinsic infection by the agency of the surgeon remains. The problem set us is indeed a difficult one, but until it is faced not only by every practising obstetrician but by the armchair critics and the State, no striking fall in the yearly death-rate from puerperal sepsis can be expected. If the operation were for the removal of a large fibroid by the same route, the patient would be fully anæsthetised in the lithotomy position on an operating-table, with an assistant standing on either side; all but the entrance to the vagina would be heavily draped with aseptic cloths, the exposed skin and the entire surface of the canal would have been soaked with a powerful antiseptic, whilst the surgeon, carefully gloved, gowned, and masked, would operate, sitting in the best possible light. If this is the ideal for the removal of one neoplasm it must surely be for the other.

I have spoken as an idealist, but I am as conscious as anyone of the difficulty of attaining in obstetrics what in other branches of surgery is the accepted routine of practice. I have in the past written often and strongly of these difficulties, and I have insisted that they can only be removed when the lay public realises that childbirth is a surgical operation requiring for its proper conduct the full gamut of surgical requirements. My object here has been to lay bare the processes whereby a woman becomes septic after childbirth, so that, clearly understanding them, each obstetrician can think out for himself the solution of the problem with which he is faced.

WAGE-EARNERS' CLUBS.—Mr. W. H. B. Fletcher, chairman, speaking at the Chichester County Sessions on Feb. 7th, said there was evidence of an increase in the reasonable use of licensed premises, and a tremendous decrease in the abuse of alcohol. There was a great deal of improvement going on to the outside of licensed premises, and he hoped it was being accompanied by improvements inside also. The public-house was the club of the wage-earning class. It was the place where they had opportunities of social intercourse with their friends and neighbours which they could not get elsewhere, and he could not help feeling very strongly indeed that those who used the public-house as their social club had a right to look in those public-houses for something of the same amenities which those people got who were able to go to sumptuous restaurants, clubs, and hotels. If publicans and brewers would do their part to carry out improvements that might be possible. The sympathy and coöperation of the public in so doing, Mr. Fletcher concluded, was assured.

POSTURE OF THE HAND IN CHOREA

AND OTHER STATES OF MUSCULAR HYPOTONIA.

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THE posture of the outstretched hands often exhibited by patients suffering from chorea is one of the most familiar of abnormal attitudes. It is characterised by flexion at the wrist and hyperextension at the metacarpo-phalangeal joints. The fingers are either straight or slightly flexed at the interphalangeal joints, and separated, and the thumb is hyperextended and abducted (Fig. 1). This posture seems first to have been described by Warner[2] in 1885 and has recently been the subject of consideration by Wilson,[3] who has offered what appears to be the only proposed explanation. He points out that the posture of the hand in chorea is the "corresponding opposite" of the normal resting posture of the hand—namely, extension of the wrist and flexion of the fingers—and he concludes that "a physiological shift" has occurred "from one posture to its corresponding opposite." He believes that "the demonstration of this physiological 'shift' in the case of chorea can fairly be taken to argue a condition of abnormal function of the cortico-spinal system, though with the immediate proviso that this abnormal state need neither be of a structural sort nor have its ultimate origin on the motor or effector side." While I agree with Wilson that the posture of the hand in chorea is the corresponding opposite of the resting attitude of moderate flexion of the fingers and extension of the wrist, I believe that it is merely the exaggeration of a normal posture, and that this exaggeration has a much simpler physiological explanation than the one which he proposes. To demonstrate this it is necessary to examine the synergic distribution of muscular contraction in certain normal movements and postures of the hand and fingers.

FIG. 1.

"Choreic" posture of the hand, characterised by flexion of the wrist and hyperextension of the metacarpo-phalangeal joints with separation of the fingers, in a patient suffering from chorea.

The Muscular Components of Movements of the Fingers.

I shall describe as a "movement" the total set of muscular contractions which are at any time mutually combined, and I shall regard such a movement as consisting of certain constituents—namely, the actions of the prime movers or agonists, of the synergists, including fixation muscles, and of the antagonists. The three movements with which we have to deal are: (1) flexion of the fingers; (2) extension of the fingers without separation; and (3) separation of the fingers and thumb.

1. *Flexion of Fingers.*—This movement involves what is perhaps the most familiar example of synergic muscular contraction. The prime movers are the flexors of the fingers and the synergists are the extensors of the wrist. The long flexors of the fingers are also flexors of the wrist. If in flexing the fingers they are allowed also to flex the wrist this action, by approximating their origin and insertions, weakens their action as flexors of the fingers. Synergic extension of the wrist therefore strengthens the grip.

2. *Extension of Fingers without Separation.*—This is a movement which occurs in such actions as sweeping crumbs from a table with the back of the hand. The prime movers are the extensors of the fingers and the synergists the extensors of the wrists, extension of the fingers flowing naturally into extension of the wrist.

FIG. 2.

Synergic flexion of the wrist in association with separation of the fingers in a normal person.

3. *Separation of Fingers and Thumb.*—In this movement the prime movers are the dorsal interossei and the extensors of the fingers, and the abductors and extensors of the thumb. The synergists are the flexors of the wrist. This movement must be analysed in some detail, since it is the foundation of the "choreic" posture of the hand. The rôle of the extensors of the fingers as abductors is exemplified in the "trick" movement by which a patient with paralysis of all the small muscles of the hand may yet be able to abduct his fingers, provided he is not made to keep their palmar aspect in contact with a plane surface. But the extensors of the fingers are also extensors of the wrist, and unless the latter action is counterbalanced their value as extensors and abductors of the fingers is greatly reduced. This can be demonstrated by attempting to extend and separate the fingers when the wrist is maintained passively dorsiflexed. Thus synergic flexion of the wrist assists abduction of the fingers in exactly the same way as synergic extension of the wrist assists digital flexion. Consequently, while it is true that extension and abduction of the fingers with synergic flexion of the wrist is indeed the corresponding opposite of flexion of the fingers with synergic extension of the wrist, it is just as natural and physiological a movement as the latter. It is curious that Wilson should have failed to recognise this, since in the same communication in which he stresses the pathological character of the "choreic" posture of the hand he includes the following in a list of normal movements: "open closed hand; extensors of wrist relax, flexors of wrist contract."[4] In opening the closed hand this contraction of the flexors of the wrist is synergic with the contraction of the extensors and abductors of the

fingers, and is part of the very movement which elsewhere he regards as the result of a pathological "physiological shift." Fig. 2 illustrates the synergic relationship of flexion of the wrist with extension and abduction of the fingers in a normal person. The synergic relationships which exist between the muscular components of the movements we have just been considering are to be found also in the postures to which the movements naturally lead. Thus as long as the fingers are held flexed, the wrist is maintained extended. Similarly in the opposite posture flexion of the wrist persists as long as separation of the fingers. All that has been said concerning movements applies equally therefore to the corresponding postures.

FIG. 3.

"Choreic" posture of the hand in a patient suffering from a tumour of the pons and exhibiting marked hypotonia.

Relation of the "Choreic" Posture to Hypotonia.

Though the "choreic" posture of the hand is normal in its synergic pattern, its exaggeration renders it pathological, and it is this exaggeration which brings it into relationship with muscular hypotonia. Hypotonia is as characteristic a symptom of chorea as involuntary movement. To demonstrate this hypotonia clinically we have recourse to passive movement, and show that in chorea the segments of a limb can be passively displaced at the joints to a much greater extent than normally, the resistance to such displacement being much diminished. We recognise in muscle tone that state of muscular contraction which underlies posture, and which therefore constitutes a resistance to the passive displacement of a limb or its segments. In a normal person who is voluntarily relaxing his muscles this resistance is extremely slight, but its existence is proved by the occurrence of states of hypotonia, such as chorea, in which the resistance to passive movement is much less than normal. Muscle tone plays a part also in active movement. It is not necessary here to discuss to what extent the antagonists of the prime movers undergo reciprocal relaxation, for those who hold that they do would probably admit that they do not become completely atonic, but retain a residuum of tone which ensures steadiness to the movement. In hypotonic states, owing to the reduction of this tone, active movement, like passive displacement, meets with abnormally little resistance from the antagonists. Certain consequences of this are discussed by Holmes in his analysis of the symptoms of lesions of the cerebellum.[1] Here I would only point out that this hypotonia of the antagonists leads to an exaggeration of postures voluntarily adopted, since the prime movers lack the check which is exercised by antagonists of normal tone. I believe that the so-called "choreic" posture of the hand is such an exaggeration of a normal attitude. Its relationship to hypotonia is confirmed by the fact that the same attitude may be observed in patients who exhibit hypotonia as a result of conditions other than chorea. Fig. 3 shows a pronounced example of the attitude in a child who presented the clinical picture of a tumour of the pons and who showed marked hypotonia but no choreiform movements.

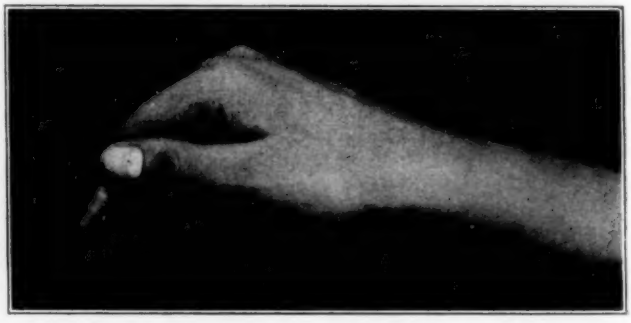
A girl, aged 11, began to suffer three years ago from headaches, vomiting, and unsteadiness of gait. There was bilateral secondary optic atrophy of moderate severity, nystagmus on conjugate deviation to either side and upwards, bilateral weakness of the external recti, weakness of both sides of the face and soft palate, and of the left side of the tongue. The upper limbs exhibited hypotonia and slight intention tremor, more marked on the right side; the lower limbs were slightly hypertonic and showed some loss of voluntary power, with exaggerated tendon jerks. The right plantar reflex was doubtful, the left extensor. There was no sensory loss. The gait was ataxic.

The "choreic" posture of the hand is also frequently to be observed in hyperthyroidism, in patients suffering from anxiety neurosis, and in hypotonic children. It constitutes a simple and readily appreciated visible indication of muscular hypotonia, which is of considerable value in the routine examination of patients.

Lastly, it must be noted that there is no tendency in chorea to the suppression of the resting posture of moderate flexion of the fingers with synergic extension of the wrist, nor of its conversion into its corresponding opposite. The choreic patient remains capable of this attitude, as Fig. 4 shows, and if asked to hold out the hands is as likely to adopt this posture as its opposite. It is, indeed, often necessary to tell the patient to separate his fingers in order to elicit the "choreic" posture.

Since the "choreic" posture of the hand is simply an exaggeration of a normal attitude produced by the muscular hypotonia and is, moreover, not associated with any suppression of the resting posture of which it is the corresponding opposite, I cannot accept the view that it affords evidence for the existence of a "physiological shift" or "abnormal function of the cortico-spinal system" in chorea. The fact that the same exaggeration of this posture occurs in other hypotonic states renders the term "choreic posture of the hand" or "choreic hand" misleading. A better descriptive term would be "hypotonic posture of the hand," which has the advantage of stating its cause and indicating the conditions in which it is to be found. In spite of some disadvantages this is probably the most convenient description for general use.

FIG. 4.



Normal resting posture of the hand in a patient suffering from chorea (same patient as in Fig. 1).

Conclusions.

1. The "choreic" posture, of flexion of the wrist and hyperextension at the metacarpo-phalangeal

joints, is a normal synergic muscular relationship. 2. It differs from the normal posture only in being exaggerated. 3. This exaggeration is the result of the hypotonia of the antagonistic muscles, which in turn is a local manifestation of the general hypotonia occurring in chorea. 4. The same exaggeration of this posture is to be found in other states associated with hypotonia. 5. The "choreic" posture affords no evidence for the existence of a "physiological shift" in chorea, nor of any disturbance of the cortico-spinal system, being entirely explained by the hypotonia. 6. The term "choreic posture" is misleading, and the phenomenon would be better described as "the hypotonic posture of the hand."

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ON THE PATHOGENESIS OF DYSTROPHIA MUSCULORUM PROGRESSIVA.

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I HAVE read Dr. Edwin Bramwell's Bradshaw lecture [1] on the Muscular Dystrophies, Sympathetic System, and Endocrine Glands with deep interest as I have been engaged in the study of muscular tone, especially the trophic influence of the sympathetic innervation on the muscle; the first positive evidence of this was reported at the Tokyo Medical Society in September, 1924. Our studies have been published serially in the *Zeitschrift für die gesamte Experimentelle Medizin* since February, 1925, and Westphal [2] has recently published his opinions on the muscular dystrophies. I venture to present a summarised account of our investigations.

In an earlier paper [3] I expressed the opinion that progressive muscular dystrophy may be caused by lesions of the autonomic innervation of the voluntary muscle. This was based upon the experimental fact that in dogs dystrophy of leg muscles was produced by extirpating the abdominal sympathetic chain, and that the dystrophic changes were accelerated by cutting the corresponding posterior roots at the same time. This effect of the posterior roots was found later to be due to the parasympathetic innervation of the muscle. Further, we found that severance of the chorda tympani (parasympathetic) caused dystrophy of the tongue muscles,[4] while extirpation of the cervical sympathetic system produced dystrophic changes in the facial muscles.[5] Especially interesting is the fact that extirpation of the ganglion ciliaire [6] produced a typical dystrophic feature in the eye muscles within about 40 days, a very short interval compared with the months which experimental dystrophy took to appear in the limb muscles. In 6 patients out of 21 whose cervical sympathetic trunks had been extirpated for various therapeutic purposes, we [7] found marked atrophy in the trapezius, deltoid, and pectoralis major several months after operation, and histological examination revealed typical dystrophic changes. The upper arm muscles were occasionally involved, but the forearm and hand muscles were always free. The reason why muscular dystrophy did not appear in all the operated cases may be the difference of muscular innervation in different individuals—i.e., vagotonic and sympatheticotonic. In the latter class, since their muscles are chiefly under the trophic influence of the sympathetic innervation, the resection of this supply induces muscular dystrophy.

The conception that muscular dystrophy is induced by derangement of the autonomic innervation of the muscle may explain various pathological problems. In cases of amyotrophic lateral sclerosis, spinal progressive muscular atrophy, and neurotic muscular atrophy, the muscles of the forearm and hand are mostly involved, while in dystrophia musculorum progressiva the muscles of the face, shoulder-girdle, and thigh are affected, but the small muscles of the hand and foot, as well as the gastrocnemius, are nearly always left intact. Babinski and Onanoff [8] tried to explain the degree of predisposition to muscular dystrophy by the degree of rapidity of muscular development. We [9] have found in rabbits, dogs, monkeys, and human corpses that the creatin content of the hand and forearm muscles is less than that of the muscles of the thigh, upper arm, and back. On the other hand, the creatin content of the diaphragm in dogs was found to rise with the increase and to fall with the decrease of sympathetic tone.[10] This fact was amply verified in the skeletal muscles.[9] Further, we [11 12] have established in human corpses that the number of sympathetic fibres—i.e., Remak's fibres—in peripheral nerve varied considerably according to the muscle innervated. According to Hatano, N. phrenicus, NN. intercostales, N. muscularis for M. pectoralis major, M. gluteus maximus, and M. quadriceps femoris contain a number of sympathetic fibres, while rami musculares for M. policis brevis and MM. lumbricales contain only a few sympathetic fibres. This fact seems to supply an important clue to the problem of the characteristic localisation of muscular atrophy in the diseases mentioned. We have already shown that, when the autonomic innervation of a muscle is left unimpaired, muscular atrophy is inhibited in the diaphragm [13] and the muscles of the tongue,[4] eye,[6] and face [14] when the motor fibres are cut. Similar results were obtained by Boeke [15] and Agduhr [16] for the eye and intercostal muscles. It is therefore easy to understand why, in the first group of muscular atrophy mentioned, the hand and forearm muscles, which have less sympathetic innervation, are affected first and most intensely. Indeed, in four cases of amyotrophic lateral sclerosis and one case of spinal progressive muscular atrophy we [3] have proved that the sympathetic innervation of the atrophic muscles remained intact. In dystrophia musculorum progressiva, however, the autonomic innervation of muscle is impaired, and the muscles which have more sympathetic innervation are affected earlier and more intensely than those which have less. The eye and respiratory muscles are evidently exceptions, because, notwithstanding their ample autonomic innervation, they are affected seldom or late. As described above, extirpation of the cervical sympathetic trunk causes dystrophy of the muscles of the shoulder-girdle, and eventually of the upper arm, while the forearm and hand muscles nearly always remain unchanged. Moreover the muscular tone and tendon reflex of the sympatheticotomised muscles decrease just as in dystrophia musculorum progressiva [5]; both the sympatheticotomised and dystrophic muscles become easily tired, but are readily restored by the administration of adrenalin, which will not, however, eliminate the fatigue of a normal muscle.[17] It is a well-known fact that a dystrophic muscle shows neither fibrillar contraction nor electrical R. D. According to Matsuura,[18] a sympatheticotomised muscle, although in a state of distinct atrophy, shows only a simple decrease of electrical excitability without any indication of R. D. or fibrillar contraction. From these numerous facts we regard it as highly probable that dystrophia musculorum progressiva is due to degeneration of the autonomic innervation of voluntary muscles.

We [3] have found, in two post-mortem examinations of dystrophia musculorum progressiva, fairly distinct changes in the sympathetic chain and sympathetic fibres in the peripheral nerves. Hitzig [19] reported many years ago a case in which he observed a marked dystrophy of the right and a slight change in the left cervical sympathetic system. It is desirable, therefore, to pay special attention to the autonomic innervation of muscles in the post-mortem examination of dystrophia. Further, in coöperation with Matsuura, I

found that extirpation of the spinal ganglion produced muscular dystrophy in the hind legs of dogs.[20] This must be due to the removal of the intermediate ganglion of the centrifugal parasympathetic fibres in the posterior root.[21]

Classification of Muscular Dystrophies.

Muscular dystrophies can be brought about by the affection at various places of the autonomic innervation of muscle. First, affection of the nerve end-plate must be mentioned. It is also possible that dystrophy may be caused by the alteration of Boeke's accessory end-platelets, although this has not yet been proved. Secondly, change in the sympathetic chain, and the sympathetic as well as the parasympathetic fibres in the peripheral nerve constitute a group to which belong Hitzig's case, two of our cases of dystrophia musculorum progressiva,[3] and muscular atrophy in six sympatheticotomised patients. Thirdly, changes in the autonomic nuclei of the spinal cord comprise a group to which belong the various cases reported by Erb [22] as dystrophies resulting from lesion in the spinal cord—i.e., the cases of W. Müller (degeneration of the anterior grey column), Dejerine (two cases of infantile spinal paralysis), Joffroy and Achard, Hitzig, Kawka (infantile spinal paralysis), Oppenheim (poliomyelitis anterior chronica), dystrophia musculorum progressiva after poliomyelitis anterior acuta; a case reported by Kaumheimer [23] (who found five similar cases in older reports), and our case.[9] As described above, muscular dystrophy occurs after extirpation of the cervical sympathetic trunk in a post-apoplectic spasm. Matsuura [18] has observed that total crushing of the spinal cord combined with extirpation of the abdominal sympathetic chain produces muscular atrophy fairly quickly, and it is therefore possible that dystrophia musculorum progressiva can be produced as a complication of a lesion of the pyramidal tract. Jendrassik [24] has reported a case of paralysis spinalis spastica accompanying muscular dystrophy.

A. Westphal [2] recently reported a case of dystrophia musculorum progressiva with the extrapyramidal symptom-complex, and suggested that the coexistence of these apparently different syndromes may be due to lesion in the mid-brain where the higher centre of the autonomic system is to be found. He is inclined to think that the higher centre for the autonomic muscular tone lies in the mid-brain, but I would suggest that the higher centre for the parasympathetic muscular tone is in the mid-brain, and actually in the hypothalamus, because parasympathetic muscular tone is not a necessary accompaniment of Parkinsonism. We are convinced, by the ample experimental evidence [23 24 25 26 27 28] which has accumulated in the last few years, that the cerebellum, and indeed Deiter's nucleus, is the site of localisation of the higher centre for sympathetic muscular tone. On the other hand, Jendrassik [24] has pointed out that dystrophia musculorum progressiva is found in association with Friedreich's disease, and gives as examples the cases of Joffroy, Dejerine, Erlenmeyer, Gowers, Mendel, and Ormerod, besides two cases of his own. Bing [29] has also reported a similar case. The autopsy of a case of Friedreich's disease which had been observed for 20 years by my predecessor, Prof. Irisawa, revealed the dystrophic alteration in muscles and the typical changes in the cerebellum (which was conspicuously small) and spinal cord. I propose, therefore, to classify such a form of dystrophy, due to the lesion in the cerebellum (the centre for the parasympathetic innervation of muscle) and mid-brain (the centre for the parasympathetic innervation of muscle), as the fourth group, which corresponds to amyotrophic lateral sclerosis caused by lesion of the motor innervation of muscle. Further, in coöperation with Matsuura [21] I found that extirpation of the spinal ganglion produced muscular dystrophy in the hind legs of dogs. This must be due to the removal of the interposing ganglion of the centrifugal parasympathetic fibres in the posterior root.

(*References at foot of next column*).

Clinical and Laboratory Notes.

A NOTE ON THE LATEST DEVELOPMENT IN STEREOFLUOROSCOPIC WORK.

BY F. HOWARD HUMPHRIS, M.D. BRUX., F.R.C.P. EDIN., D.M.R.E. CAMB.

WHEN Prof. Roentgen showed in Wurzburg in 1897 his X ray discovery and demonstrated its value for looking within the body, it was said then how wonderful it would be if the various shadows could be shown in plastic form rather than as a flat silhouette. Progress in this direction has been hampered in several ways: the law governing stereofluoroscopy has not been fully recognised. The law stated simply is that angles of vision which the X rays make with the body should be identical with those made by the vision of the observer of the body.

Among other difficulties which have retarded progress is the fact that early in the days of X rays the tubes were of a size which rendered stereofluoroscopy impossible. The gas tube, unwieldy in size and uncontrollable in action, was unsuitable for stereofluoroscopy. Caldwell, of New York, struggled with the problem in spite of other difficulties with scant success until the advent of the Coolidge tube. He fully recognised the value of stereofluoroscopy and he constructed the first workable, though imperfect apparatus for this branch of work, which was used chiefly for the localisation of foreign bodies during the war. In London during this period there was an apparatus similar in principle designed for use with coils, but difficulty arose here too, in that the tubes, if large enough to stand up, were too large to approximate, and if small enough to approximate failed radiographically. The advent of the hot cathode tube has rendered success in this direction possible, another assistance being the production of new screens eliminating phosphorescence. These may have fulfilled their mission during the war, but were quite inadequate for the finer scientific work required in peace time for the full development of diagnostic X ray work.

The X ray diagnostician must have always had the feeling that there was something wanting, and can

Dystrophia Musculorum Progressiva: References.

(*Continued from previous column.*)

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never have felt satisfied with the flat shadow, especially in lung conditions where even the best stereoscopic plates gave an unsatisfactory result, because of the time which hitherto has elapsed between the two required exposures and the inevitable movement which must take place in it. Even the most satisfactory, accurate radiogram of the lungs only gives one position of a more or less rigid lung. With this, the most flexible of all organs, a stereoscopic vision is important—for example, in a lung with an old artificial pneumothorax, apparently cured, with a sputum free from T.B. it is important to see what adhesions there may be and in what position they are and what the flexibility is.

Other occasions for viewing moving organs, such as the duodenum for example, readily occur to one. This necessity has urged scientists and engineers to attack the problem afresh—employing new tubes, new screens, and adapting apparatus to the law governing stereofluoroscopy. Such an apparatus I have recently examined in Munich. It was exhibited in Wiesbaden in the spring of last year at the X ray congress held in that city, where it was declared that if successful it would be of the utmost importance in all future X ray diagnosis. Of this invention of Mr. F. E. Bornhardt I have made a careful examination and have seen two of them in good working order, one at Krankenhaus Rechts-der-Isar and the other at the Lungenfürsorge Anstalt in Halachin in Munich; of these I append a brief description. The apparatus consists of two specially constructed X ray tubes small in diameter placed side by side and connected with an alternating current supply in such a way that they emit X rays alternately. These impulses fall upon a fluorescent screen producing two shadow images of a body, placed between tubes and screen. The observer views the screen through a mechanical device—with a diaphragm rotating before the eyes in synchronisation with the two impulses from the X ray tubes—the result is that one eye sees the image produced by one tube and the other the image from the other tube, the physiological action of the brain combines these two pictures into one plastic impression. The movements seen on the screen appear to be continuous, as each eye is supplied with 50 pictures per second. The electrical supply is the usual A.C. and the X ray impulses from the tube and the opening of the diaphragms being of the same origin are in synchronism. A part of the mechanical construction consists of a device whereby the angle of the X rays to the body is rendered identical with that of the angle of vision, this being so whether the observer approaches the patient or recedes from him.

Having seen this apparatus when working I feel that the solution of the problem of satisfactory stereofluoroscopy has been attained.

A CASE OF SYPHILIS OF THE UTERUS.

By Hannah Billig, M.B., B.S. Lond.,
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Very few cases of syphilitic disease of the uterus other than primary chancres of the cervix have been described. The following case, which was under the care of Miss E. Sylk at the Elizabeth Garrett Anderson Hospital, is therefore of sufficient interest to be recorded.

The patient, a married woman aged 35, was admitted in September, 1927, complaining of left-sided pain radiating down the leg. She had one child 6 years old and had had three miscarriages in January, April, and September, 1926. Since November, 1926, her periods had been regular and the loss had been normal. Previous to her marriage her periods had always been regular with normal loss. Except for rheumatic fever at 18 and an appendicectomy in 1924 she had been fairly healthy, though anæmic. There was no history of sore-throat, alopecia, or skin rashes, except for a single patch of psoriasis on her arm, present for the last five years. The husband was healthy and gave no history of syphilis. On admission general physical examination revealed no abnormality other than a palpable spleen. The uterus was enlarged and bulky. Fibroids were diagnosed and Miss Sylk performed a panhysterectomy with removal of both tubes and ovaries, as at the operation the appearance of the fibroid was strongly suspicious of sarcoma. Her recovery was uneventful.

Macroscopic Examination of the Uterus.—The uterus measured 5 in. by 4 in. by 3½ in. and showed a mass on the right side situated in the fundus and projecting subperitoneally. This mass, which was 2½ in. in diameter, had the "ham fat" appearance associated with sarcoma, but had a very irregular and angular edge. The uterine wall was much thickened, the wall of the fundus being 1½ in. thick.

Microscopic Examination.—Section of the tumour mass on the right side showed a necrosis of the muscle-fibres, bounded by a richly cellular zone showing miliary and conglomerated gummata. The myometrium was so infiltrated by lymphocytes and endothelial cells that the muscle-fibres were separated. Section through the fundus showed the myometrium infiltrated with gummata of varying size, mostly miliary. The muscle-fibres were separated by lymphocytic infiltration. The smaller vessels and capillaries were dilated and showed a perivascular collection of lymphocytes and plasma cells of varying extent, the beginnings of small gummata. The walls of the medium-sized vessels were much thickened, the medial coat showing most change. The endometrium showed slight increase in thickness. Miliary gummata were present throughout, but the reaction was much less marked than in the myometrium. Sections through the right uterine vessels showed very markedly increased thickness of the walls, chiefly of the intimal coat. The vasa vasorum were dilated and showed perivascular infiltration with lymphocytic cells. There was some increase in the subendothelial tissue. Some vessels showed subendothelial plaques with proliferation of the media and some showed almost complete obliteration of the lumen. The smaller vessels showed well-marked perivascular reaction with the formation of gummata. This reaction extended throughout the surrounding myometrium with formation both of miliary and diffuse gummata. The necrosis of the wall appeared to be due to the cutting off of the blood-supply by the changes in and around the vessels supplying this area.

Sections of the tube showed a similar gummatous reaction in the subserous and muscular coat. The larger vessels showed thickening of the media and perivascular infiltration round the vasa vasorum. The plicæ were somewhat thickened, but not adherent. There was some endothelial interstitial tissue reaction.

Sections of the ovary showed only increased fibrous tissue and corpora albicantes.

Sections were stained by the Ziehl-Neelsen method for tubercle bacilli and by the Levaditi and Fontana methods for spirochætes, with negative results. The Wassermann and the Sachs-Georgi reactions were positive in the patient, but the husband's blood was negative.

Hoffmann described the only case I could find at all similar to this.

His patient, admitted with chronic sepsis following the delivery of living twins, showed a necrotic tumour the size of an apple on the anterior cervical lip. A portion of the tumour removed for diagnostic purposes showed in section the histological appearances of a gumma. At the post-mortem examination four weeks later the right tube and ovary were found in one gummatous mass and the entire surface of the endometrium was replaced by a similar mass several centimetres thick, penetrating deeply into the myometrium. Gummata were also present in the liver and in the lungs.

Portis recorded an interesting case showing very early secondary syphilitic changes in the uterus.

His patient, aged 38, was admitted for metrorrhagia. On examination the cervix was thickened and indurated, the surface being ulcerated and covered with a greyish exudate. The uterus was moderately enlarged. Carcinoma of the cervix was diagnosed and a panhysterectomy done. The patient made an uneventful recovery, but returned seven weeks later with an extensive secondary rash. The Wassermann reaction was strongly positive. Microscopical examination of the uterus showed signs of a healing chancre on the cervix. The endometrium was diffusely infiltrated with lymphocytes and plasma cells, and this infiltration extended throughout the thickness of the myometrium, being more marked just beneath the endometrium. The left ovary showed a corpus luteum extensively infiltrated by lymphocytes and plasma cells. Sections stained by the Levaditi method showed treponemata in the cervix and the myometrium, and an occasional one in the corpus luteum and the stroma of the left ovary.

Various authors have described cases of syphilitic fibrosis of the uterus. The majority based their diagnosis of the condition on the fact that menorrhagia had reacted to antisyphilitic treatment, when the Wassermann reaction had been positive. In those

few cases where the uterus was examined arteriosclerotic changes were noted. Some deny that this is evidence of a syphilitic infection, as they found similar changes in non-syphilitic uteri.

It is interesting to note that fibrosis can occur as a late result of the gummatous condition described in this paper, and that the latter is probably preceded by the secondary changes recorded by Portis.

I have to thank Miss Sylk and Miss E. H. Lepper for permission to publish the case.

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A CASE OF
STRANGULATED INGUINAL HERNIA
IN AN INFANT AGED FOURTEEN DAYS.

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THE following case is of interest on account of the rarity of strangulated hernia at so early an age.

The child was admitted into the Miller General Hospital on Dec. 7th, 1927, on account of vomiting and the passage of blood per rectum. It was one of twins aged 14 days and a swelling in the right inguinal region had been present since birth. Several other children in the family were likewise born with a "rupture." On Dec. 6th the parents thought the child did not seem well and on the 7th he vomited and seemed very ill. The bowels were opened before admission following the use of a soap suppository.

On admission the baby looked ill and somewhat undersized. The clothes were stained with vomit, which was fæculent in nature. Temperature 96° F.; pulse-rate, 116; respiration-rate, 44; weight, 4¼ lb. In the right inguinal region was a swelling conforming more to the shape and feel of a hydrocele than to a hernia. On attempting to reduce the mass into the abdomen the baby cried violently and no decrease in size resulted, neither did it disappear when the infant was suspended by its heels. The abdomen was distended but fairly soft; visible peristalsis was seen, but no tumour could be palpated. Rectal examination revealed no tumour or emptiness in the right iliac fossa. There was blood on the examining finger and some fæces were passed.

As strangulated hernia is rare in an infant of this age there seemed some doubt as to whether the baby was suffering from an intussusception or whether the inguinal swelling was a strangulated hernia, but it was decided to explore the inguinal canal. The operation was performed under spinal anæsthesia with ½ c.cm. stovaine solution, and this successfully abolished the movements of the lower limbs. When an incision had been made over the right inguinal canal the mass was found to be a hernia. The sac was cleaned and opened and contained a portion of the ileum. The bowel was purple, but the peritoneal coat was shiny and it was evidently viable. Reduction could not be effected by taxis until the neck of the sac had been divided, following which procedure a part of the cæcum prolapsed. After reduction the neck of the sac was ligated and the conjoined tendon and the inguinal ligament approximated with sutures. The spermatic cord and accompanying structures were not defined during the operation.

The child made a good recovery and retained sterile water by mouth immediately, with no more vomiting. Breast feeding was impossible and citrated whole milk was given and received well except for constipation, which was relieved with saline wash-outs per rectum. Slight suppuration occurred in the wound which, however, healed in 12 days. The right testicle could not be palpated and its fate was uncertain; the left was normally descended. The baby gained weight steadily and weighed 4 lb. 14 oz. by Dec. 24th. He was discharged on Jan. 2nd, 1928.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF DISEASE IN CHILDREN AND SECTION OF SURGERY.

A JOINT meeting of these Sections was held on Feb. 24th, Mr. G. E. WAUGH, President of the Children's Section, in the chair, to discuss the subject of

CHRONIC APPENDICITIS IN CHILDREN.

Dr. ROBERT HUTCHISON began by considering the question whether chronic appendicitis really existed in children. He did not agree with a writer who stated that in the earlier years of life appendicitis was either acute or non-existent, for the occurrence of chronic appendicitis had been proved by exploration; nevertheless he believed that it was rare under 14 years of age. Another question was whether the chronic condition always arose out of an acute attack. If so it should be possible to learn of an illness which might have been acute appendicitis, but such a history could not always be obtained. There was the chance that an acute event had been passed over as of no consequence or had been mistakenly regarded as stomach trouble or a "bilious attack"; but, on the other hand, there seemed to be no *a priori* reason why a primarily chronic inflammation of the appendix should not occur, just as tonsils might be chronically inflamed, although there was no history of acute tonsillitis.

Granted the existence of chronic appendicitis in childhood, what were the symptoms and signs by which it could be recognised? In the adult appendicitis might simulate gastric disease, but he did not think "appendix dyspepsia" occurred in childhood; in the young the condition was more apt to simulate an affection of the colon. In the clinical picture presented by chronic appendicitis in childhood the cardinal feature, in Dr. Hutchison's opinion, was recurrence of episodes of abdominal pain, either with or without vomiting and slight fever, lower abdominal pain being the most constant and important. Fever might be either slight or absent, and if the patient happened to be seen between attacks there might be no physical signs. If pressure over McBurney's point caused pain at that spot and there was no tenderness elsewhere, it was suggestive of appendicitis, especially if the pressure caused pain which was referred to the epigastrium; but this sign could be elicited with confidence in only a few children. Pain confined to the right iliac fossa he believed to be but rarely due to chronic appendicitis, but if the pain came on after exertion, rather than after a meal, it suggested appendicitis. If the patient happened to be seen during an attack the diagnosis became easier, as there should then be tenderness, perhaps rigidity, on palpating the right iliac fossa, though it must not be forgotten that these signs might be due to inflamed glands. Radiography, he thought, could not determine the diagnosis; indeed it might only add another element of doubt to an already doubtful situation.

Among the conditions which might simulate chronic appendicitis in childhood were: other organic conditions in the right iliac region, such as enlarged glands; kinking of ileum or appendix; a mobile cæcum; and an adherent Meckel's diverticulum. He did not think they could be reliably distinguished from chronic appendicitis, nor from one another, except by exploration. Obstruction of ureter by stone should be detectable by radiography and by expert examination of the urinary passages and of the urine. Pelvic affections in girls could be diagnosed usually by bimanual examination per rectum, under anæsthesia if necessary. Ovarian pain at about puberty for which no organic basis could be found usually ceased with the regular onset of menstruation. Intestinal colic was very common in childhood, and was sometimes

accompanied by vomiting. Sometimes colonic pain could not be distinguished from that of appendicular origin. Often the pain was referred to the umbilicus and was for this reason sometimes called "umbilical colic." The more frequent the pain and the closer its onset was related to meals the less likely was it to be due to chronic appendicitis. But Dr. Hutchison thought a long and adherent appendix might play a part in disturbing the colon. Often, too, slight attacks of acute appendicitis were mistaken for "bilious attacks." Some surgeons appeared to think that cyclical vomiting could be cured by removal of the appendix. His own view was that true acidosis, with recurrent vomiting and perhaps fever, and the presence of acetone bodies in the urine, were of hepatic origin. These cases could be distinguished from acute appendicitis, too, by the great predominance of vomiting and by the comparative absence of pain. Still the same kind of child was subject to both conditions. In many cases the diagnosis of chronic appendicitis in the child was more or less conjectural. In his own practice, when everything discoverable seemed to point to chronic appendicitis, what he advised was not appendicectomy, but exploration of the right iliac region. He specially advised this if the child was being sent to school where surgical help would not be readily obtainable, if the parents were worried lest appendicitis should occur, and in cases in which there was a strong family history of the disease. In most of the explored cases appendicitis had not been the cause of the symptoms, but the surgeon had seldom drawn a blank; he often found a kink, or enlarged glands, or a constricting band.

Surgical Points of View.

Mr. A. J. WALTON said that in most cases of so-called chronic appendicitis there was an atonic condition of the cæcum associated with virginal ptosis. Of 906 cases of appendicitis uncomplicated by any other lesion, 601 were acute and 305 chronic. In this series 186 of the patients were under 14 years of age, but in only 33 was the condition chronic. The mortality of acute appendicitis in childhood was still too high. It was well known that it was difficult to obtain a complete history in the case of young children; therefore an account of any bout of severe pain and vomiting should be taken seriously, especially if followed by localised signs of appendicular trouble. In five of his cases the lesion found was a subacute or chronic inflammatory change in the mesenteric glands, especially those at the ileo-colic angle. In five cases of visceroptosis in girls aged 13 there had been frequent attacks of pain in the right iliac fossa and lower abdomen, but without the formation of an inflammatory mass. In four cases with symptoms suggestive of appendicitis threadworms were found in the lumen of the appendix. He had not met with any cases of appendicitis in children in which the condition had been chronic from the beginning.

Mr. H. W. CARSON said he had no doubt, from his own experience, that chronic appendicitis occurred in children, but there were important respects in which it differed from the same condition in the adult. He agreed with Dr. Hutchison that the so-called "appendix dyspepsia" did not occur in children, neither did they suffer from symptoms of visceroptosis, though they might be found to have a mobile cæcum. In children it was common to find the appendix in the "5 o'clock position"—a dangerous position, as the appendix was hanging over the pelvic brim. Threadworms in the appendix produced chronic appendicitis, rather than an acute perforative lesion. With regard to the presence of glands in the ileo-cæcal mesentery, he had concluded, as the result of a good deal of study, that these glands were not tuberculous at the outset; he believed that originally they were chronically inflamed, and that subsequently the tubercle bacillus found a congenial habitat in them, owing to their low resistance. He regarded infection of these glands in the mesentery not as a part of a systemic infection, but as a local one, probably due to ingestion of tuberculous milk. In the majority of cases he thought enlarged glands in this region could be differentiated clinically from appendicitis, and in making the diagnosis he laid most stress on the character of the attacks; though periods of pain might occur repeatedly, it was not continuous as it was in appendicitis. He agreed that in children the difficulty was to get an unequivocal history of acute attacks of appendicitis preceding the more chronic condition.

Doubts and Criticisms.

Dr. G. A. SUTHERLAND expressed himself as still uncertain whether chronic appendicitis existed in children, though admittedly if an attack of acute appendicitis had been skilfully treated by the physician adhesions might have formed and produced symptoms which some might term chronic appendicitis. That, however, was not what was usually understood by the term. He did not agree with Dr. Hutchison that a child should be operated upon because the parents were over-anxious about appendicitis, nor did he think there was evidence of appendicitis being a familial complaint. He would rather allow such a child to play about with other children and watch the result, as in doubtful cardiac disease, giving at the same time a full diet.

Mr. WARREN LOW hoped that Dr. Sutherland's ideas would not be accepted. He spoke of two members of a family of three dying of acute appendicitis, the third nearly succumbing to the same complaint. He had always felt convinced of the presence of chronic appendicitis in children. Some appendices, when exposed, were stiff and chronically inflamed; indeed they seemed to be almost composed of erectile tissue. He believed that chronic inflammation of the ileo-cæcal glands had a definite relationship to the state of the appendix.

Dr. A. CAWADIAS did not agree with the division of appendicitis into acute and chronic; he believed it made for clarity to speak of the acute stage as paroxysms of an otherwise chronic state of inflammation of the region. If such a conception were prevalent he thought there would be less temporising, which so often led to disaster. Still, there was little doubt that many unnecessary operations were carried out for the condition. Observation with the iridescent screen, combined with palpation of the appendix region—especially the point of its insertion—was a valuable aid to diagnosis.

Mr. L. E. BARRINGTON-WARD said that what Dr. Hutchison referred to as chronic appendicitis he personally preferred to regard as recurrent appendicitis. No sane surgeon would operate for acidosis under the belief that it was appendicitis. He did not think that visceroptosis was ever found in a child. He agreed that when there occurred chronic attacks of disease, such as several speakers had mentioned, exploration should be carried out.

Dr. A. G. MAITLAND-JONES declared himself also a sceptic on the subject of chronic appendicitis in childhood. He agreed with Dr. Hutchison that in some cases it was desirable to "treat" the parents, especially as an exploration might prevent a catastrophe.

Two Forms of Chronic Infection.

The CHAIRMAN pointed out that when examining the abdomen of a child who was not suffering from acute appendicitis it was impossible to predict what was the intimate cell structure of the particular appendix. The pathologist would in many cases say, on its removal, that there was no evidence of inflammation, but he supplied no test which allowed the clinician to decide on the nature of the condition present. Mr. Waugh drew special attention to two types of chronic inflammation. One was a primary tuberculous infection of the appendix, which, in his experience, was more common when the appendix was in a hernial sac than when it was in the abdomen. It attracted attention by the intensity of the pain, unassociated with toxæmia, and if there was no spread by miliary tuberculosis to other parts of the

peritoneum, the condition could be cured by removing the grossly tuberculous appendix. The other condition was invasion of the appendix by streptothrix, and this constituted one of the most disastrous traps to be met with, as there were no abnormal signs suggestive of primary abdominal disease. The evening temperature might reach 106° F., dropping in the morning to 99°, the only accompaniment being a vague abdominal discomfort, and after several weeks a small circumscribed tender swelling appeared, giving an impression that the appendix was encapsuled. A few days after removal of the appendix, however, the patient seemed worse, and a glistening substance might be observed in the affected area, as if a snail had crawled over it.

Replies.

Dr. HUTCHISON said he was prepared to accept Dr. Cawadias's definition of so-called chronic appendicitis. With regard to observation with the iridescent screen he still felt it must be difficult to distinguish a tenderness which was due to glands from that due to the appendix itself. He did not think that even the leucocyte count would make diagnosis certain. He certainly did not agree with Dr. Sutherland that in doubtful cases one should get the child up and out of bed, to see what happened; what might happen was perforation of a gangrenous appendix. The heart did not furnish a parallel case, for a heart had great power of recovery if tried a little too far. To explore the appendicular region in the doubtful cases in which the parents were very anxious was not only of benefit to the parents, but also had a good reaction through them on the child.

Mr. WALTON said he had not seen threadworms in acute attacks; usually they were harmless passengers, but in the cases he had mentioned the symptoms cleared up after removal of the appendix. Often, he agreed, enlarged ileo-cæcal glands were not primarily tuberculous. Adhesions which formed after operation for appendicitis showed a natural tendency to disappear later.

SECTION OF EPIDEMIOLOGY.

A MEETING of this Section was held on Feb. 24th, with Dr. L. S. MONCKTON COPEMAN, the President, in the chair, when Dr. REGINALD MILLER read a paper on

SOME PUBLIC HEALTH ASPECTS OF JUVENILE RHEUMATISM.

The incidence of heart disease showed, he said, that rheumatism occurred in 1·5 to 2 per cent. of urban elementary school-children. Its depredations were best studied in this class, but there were two difficulties in estimating its amount. First, heart disease was much commoner in school "leavers" than in school "entrants," and, secondly, the disease was more common in urban than in rural children. Probably the figure for entrants was about 1 per cent., and for leavers between 2 and 2·5 per cent. There was little evidence of the incidence in secondary schools, but at the Polytechnic School in Regent-street 1·53 per cent. of the 600 boys showed rheumatic heart disease in the years 1924–26. An interesting fact was that of the fee-paying boys only 0·98 per cent. had cardiac trouble, while the figure was 2·57 per cent. for those entering with scholarships from elementary schools. It was difficult to estimate what proportion of the 60,000 deaths annually attributed to heart disease were really due to rheumatism. In hospitals the proportion was about 50 per cent., but Dr. Miller thought it safer to put the figure at 20,000. Coombs had estimated that about five years of increasing invalidity preceded every death. Under the age of 2 rheumatism was practically unknown; from 2 to 5 it was uncommon, and the maximum incidence occurred between 7 and 8. At puberty the disease began to change to the adult type. The factors governing the age-incidence were, in Dr. Miller's opinion, chronic tonsillar infection, the less protected régime of school life, and childhood's diminished resistance to infection. The upper limit of the class incidence was well seen in the absence of the disease from private schools and its rarity in private practice. The lower limit was less definite but very interesting; the real rheumatic stratum lay in the upper section of the poor. The class incidence showed that the onset of the disease was not entirely governed by overcrowding, underfeeding, dirt, or the other accompaniments of semi-destitution. Clinical workers were convinced that the disease did not spread from case to case.

The Environmental Factor.

When London poor children were taken away from home and put in country residential schools rheumatism was unknown among them. This fact urgently needed explanation. Inheritance, at the most, could only aid and abet environment. The special factor, the speaker believed, was damp dwellings. Damp predisposed to catarrhal colds and so might affect the tonsils. The disease was commonest in cold, damp countries, and the sites of the homes of rheumatic children tended to be on low-lying areas and to follow water-courses. Recent investigations had shown that about 60 per cent. of rheumatic children were living in obviously damp rooms. The proportion of a series of non-rheumatic families living in damp rooms was only 30 per cent. It was the condition of the house rather than of the site that was important; rheumatic and non-rheumatic areas might lie side by side. In Eton town there was plenty of juvenile rheumatism; in Eton College none. This factor explained why the poorest people of all suffered less, for overcrowding meant more warmth and less damp. Notification was worth while, as it gave a keen medical officer of health the chance to deal with unhealthy houses. An urgently needed reform was adequate warming and drying of children who arrived at school wet. School "inspections" must be turned into examinations, but treatment should be left to practitioners and hospitals.

Dr. J. TERTIUS CLARKE read a paper on the

PATHOGENESIS OF RHEUMATIC FEVER IN ITS CLIMATOLOGICAL RELATIONSHIP TO A POSSIBLE INSECT CARRIER.

He pointed out that during more than 30 years' service in the Malay Peninsula he had not seen a single case of rheumatic fever, chorea, or subcutaneous nodes. Inflamed tonsils were as common in the tropics as in England. The very few cases reported from the tropics were not true rheumatic fever. The common rat flea, *Ceratophyllus fasciatus*, had also not been found in the tropics, its upper temperature limit lying at about 70° F. It flourished in a humidity of 70 per cent. The environmental conditions favouring the fever also favoured the rat flea. The evidence that a bacillus caused rheumatic fever was not convincing, and he suggested that the disease might be due to a protozoon carried by the rat flea. Protozoa, like rheumatic fever but unlike bacilli, were unevenly distributed over the world, and the lesions of the disease were formative and proliferative rather than exudative. The slight leucocytosis of the fever was mononuclear.

The Case against the Dampness Factor.

The PRESIDENT said he had seen in country villages conditions of dampness far worse than anything in towns, and he felt that Dr. Miller's suggestions required further investigation.

Dr. J. A. GLOVER said that he feared Dr. Miller's arguments were not so watertight as the houses he would like to see. He thought that the placing of highest incidence in the upper stratum of the poor was due to the fact that the principal investigators had worked in the more prosperous parts of the town. The figures published in the Medical Research Council's report showed that the difference between the poor and the very poor was not great enough to be significant, and what evidence there was went the other way. Moreover, the really destitute mother would not take her children to clinics; she waited

till they were really ill and then took them to the infirmary. He showed a table of the children in the infirmaries of London; Poplar had 98 children under 15 suffering from acute rheumatism, and Marylebone only 10. The work of Carsdale in the Isle of Dogs and Homerton in 1911 had shown that an enormous proportion of really destitute children were rheumatic, and workers in New York had pointed out the marked effect of malnutrition. Familial incidence had been strikingly brought out by the researches of Mrs. Forest Smith. The high rate at the Royal Naval School at Greenwich (S. F. Dudley) showed the ill-effects of overcrowding on picked boys. The map published by Dr. Matthew Young showed that the mortality-rate was lowest of all in the Ouse and Cam valleys, where sanitary authorities were backward, and there were plenty of damp houses on damp sites.

Dr. F. C. SHRUBSALL described work done by his wife, showing a very definite association between rheumatism and water-courses. Aliens had been found to be much less affected in the same areas. The worst houses were always in the valleys, and it might be that new houses were damper in themselves. Where an old area had been cleared and rebuilt, as in the Wandle valley, there was high incidence. He pointed out that the school medical inspection was no procession past a point, but a thorough investigation.

Dr. J. NAIRN DOBBIE also described the carefulness of the examination and after-care of school-children. Of 100 cases he was analysing 35 came from very poor slums and 60 from very poor homes verging on the slum type. Rheumatism, in Dr. Dobbie's opinion, was essentially a poverty disease, and reflected the degree of poverty to a very great extent. Sixty-six per cent. of his cases showed a clear and immediate family history of rheumatism, and in a further 11 per cent. the disease appeared in the immediate collaterals. Although environment was the immediate cause there was a definite diathetic factor. The tonsils were defective in 80 per cent. of cases, but in no case was the child of the typical adenoid type, and it was not the catarrhal child who developed rheumatism, but the nervous, highly strung, psychasthenic type. The future of school medicine lay in the improvement of environment at the "pre-school" stage, between the ages of 2 and 5, as many of the children entering school at 5 were recognisably "pre-rheumatic."

Dr. WARREN CROWE suggested that rheumatic infection might be conveyed by the immune adult to the susceptible child through the nurse's habit of tasting food from the child's spoon.

Dr. DAVID NABARRO suggested that information might be gained by following up for several years the children whose tonsils had been removed at hospitals, and that it would be worth while to test the biochemical reactions of the tissues of the rheumatic child and his brothers and sisters and see if they differed from those of the non-rheumatic child.

Dr. MILLER, in reply, said that statistics of rural children were so inadequate as to be unreliable. Dr. Dobbie's figures proved nothing but that a large number of very poor children suffered from rheumatism. The only really satisfactory test was the geographical one, over a circumscribed area in one district. This had only been applied by Mrs. Shrubsall and in Birmingham, and both researches had shown that rheumatic and poverty areas did not properly correspond. He begged the public health authorities to bridge the great gulf between clinical and bureaucratic medicine and to build upon the foundations laid by clinicians in this matter, and not start de novo and waste years of work.

Dr. CLARKE, in reply, said that practically every environmental factor mentioned that evening was common to the rat flea and to rheumatism. The rats lived along rivers and in crowded residences. The rat flea was rife in Lancashire and Yorkshire, and very rare in the Eastern counties.

MEDICO-LEGAL SOCIETY.

DISCUSSION ON THE INFLUENCE OF PARTURITION UPON INSANITY AND CRIME.

A MEETING of this Society was held on Feb. 23rd with Sir WILLIAM WILLCOX, the President, in the chair, when Prof. LOUISE MCILROY read a paper on this subject, which we published in full last week, p. 379. A long discussion followed.

Mr. Justice HUMPHREYS said that the best answer to the critics was that no jury in this country had ever yet convicted a woman in the circumstances suggested by Prof. McIlroy. The verdict "Guilty but insane" amounted in law to one of "Not guilty, but the prisoner should be detained until His Majesty's pleasure is known." English law would never be logical, but the English people had an extraordinary capacity for doing justice by perhaps illogical means, and the practice of leaving the question of insanity to the jury did in fact result in justice being done. The rules in McNaghten's case were not particularly logical, and might admit of amendment, but the speaker doubted very much whether they acted unjustly on persons who had committed crimes when insane and therefore not responsible. It was important not to include in Acts of Parliament anything that might help the criminal to escape. Juries tended perfectly naturally to take advantage of any circumstance that might enable them to acquit when the penalty was a very serious one, and they should not be assisted to go wrong in this direction. This was the difficulty in the way of altering the language of the Infanticide Act in the direction suggested. The Act was probably unnecessary, except to prevent the horrible farce of a judge assuming the black cap and sentencing to death a person who, as he and everyone else knew, was not in the least danger of being hanged and who would probably be released in a few weeks. If, however, the Act was to remain, there should be a definition in the next Act of what was meant by "newly born." It might be possible to omit the phrase altogether and leave the question of responsibility to the jury; the only objection the speaker saw to this was that it might encourage the type of medical witness who was always prepared to come forward and swear that the accused was suffering from whatever disease would entitle him or her to acquittal. In answer to a comment by Lord Riddell, Mr. Justice Humphreys explained that the House of Lords had explained that the prisoner, found "Guilty but insane," was found guilty of having done the act which in a sane person would amount to the crime with which he was charged, but not guilty of having committed any crime. The difficulty lay in the fact that there was no adjective in the language which would convey this precise meaning.

Lord RIDDELL said that the man in the street regarded a verdict of "Guilty but insane" as a verdict of "Guilty of murder but insane," a mistake that would be avoided if the law were altered as the learned judge and Prof. McIlroy had suggested. As he understood the law, it was the duty of a judge, when a delusion or "irresistible impulse" was pleaded and the facts were proved, to direct the jury to return a verdict of guilty. This Act had been admitted to Parliament in a most perplexing form. An amending Bill in the form suggested would be very useful and a great relief to lawyers, who now had to enforce a law which was understood by no one.

Dr. F. J. MCCANN suggested that "newly born" should mean not more than 24 hours old. In the first 24 hours an unmarried woman might temporarily lose her reason through the agony of despair. It was at that time that animals ate their young, but later on the condition of affairs was quite different. Unless this limit were imposed, some medical men would always be ready to swear that a woman's crime was

due to her confinement—even two years afterwards. In a sense some women never recovered from confinement. There was no essential difference between the stress of lactation and any other stress that might cause insanity. This limit would distinguish the particular type of case from the remainder, which were adequately dealt with by the law relating to insanity. Steps should be taken to ensure adequate legal defence for poor prisoners charged under this Act, and expert post-mortem examination of the corpse of the child. To send organs or parts of organs did not give pathologists a fair chance.

Dr. C. HUBERT BOND foresaw confusion of the issue by the nomenclature suggested. Such terms as puerperal and lactational insanity were misleading. Another source of confusion lay in using such terms as "insanity," "psychosis," "mental disorder," "abnormal mental state," and "disturbed balance of the mind" without being sure how far, if at all, they were intended to be synonymous. Precision here was of vital importance if the two professions were ever to reach mutual understanding or agreement. The McNaghten rules were beside the point in a discussion on the Infanticide Act. A woman might be punished as guilty of manslaughter when, but for the Act, she would have been found guilty of murder; she became a murderess in the eye of the law and could not be sent to an asylum. In passing, Dr. Bond registered a caveat against regarding detention in Broadmoor as either being or intended to be a punishment, and against the use of the word "incarcerated" in referring to any institution for mental cases. The Infanticide Act, he said, absolved the court from an unpleasant duty, but did not absolve the woman from more than the ordeal of hearing herself sentenced to be hanged; it stigmatised and punished her as a felon. There would be no need, either biological or sentimental, for the Act if we could get rid of the McNaghten rules and of the tendency to regard the evidence of all medical practitioners, expert in psychology or not, as of equal weight. By providing the court with an escape from a false position the Act had delayed still further the attainment of unity of thought on these matters. The necessity for its improvement was obvious. The use of the undefined phrase "newly born" was particularly illogical and short-sighted. The woman might, in that abnormal mental state, kill an older child, or the child of other parents whom she had befriended.

Dr. J. S. FAIRBAIRN said that crimes committed in a state of puerperal and lactational insanity should be looked on from a totally different aspect from those due to the actual stress of delivery. The time during which the stress of parturition might lead to crime was a matter of days only, and the woman who was insane was already protected. In considering how long delivery should be a factor one had to recognise the enormous difference in the temperament, constitution, and circumstances of individual women. A week or ten days might be regarded as a fair period.

Sir HERBERT AUSTIN said that the case of Mary Donoghue had nothing to do with the Infanticide Act. She had been discharged from the infirmary completely cured and had gone back to her regular work; the crime had had nothing to do with her condition. The verdict of "Guilty but insane" was not a verdict of "guilty," and there was no appeal against it. In support of confidence in the jury's discretion he mentioned the case of a woman who had been tried twice on the charge of child murder and found guilty but insane by reason of her confinement. The question of the defence of a poor prisoner might be left quite safely to the presiding judge.

Dr. HALLIDAY SUTHERLAND pressed for the deletion of the term "newly born." If the woman were insane, the provisions of the McNaghten ruling covered her case completely. He objected to the verdict "Guilty but insane." Murder was still, in Lord Coke's terms, "with malice aforethought taking the life of a reasonable creature in being," and of that the prisoner was convicted. To be logical the verdict should be "Not guilty but insane, and therefore worthy of detention." He understood that the form of the verdict was due to Queen Victoria, who had been unable to understand how any person who threatened Her Majesty's life could be "Not guilty."

Dr. MORGAN FINUCANE objected to the verdict because it resulted in women who were not responsible for their acts being shut up in Broadmoor. He pointed out that childbirth of itself imposed a strain much greater than any other crisis, and was likely to lead to abnormal conduct quite apart from puerperal insanity.

Dr. GRAHAM GRANT gave an example to prove that patients were released from Broadmoor as from other mental hospitals as soon as they were fit to be at liberty.

Dr. NORWOOD EAST agreed that, although the law was illogical, in practice justice was done. Fatherhood equally with motherhood was a necessity for the race, and fathers were sometimes tried for killing their children and found insane. One of the contributing factors in such a case was the stress of providing for their families, and it would be difficult for juries to draw a distinction between motherhood and fatherhood.

Mrs. MARIE STOPES said that the various attempts to define "newly born" were illogical unless they limited it strictly to 24 hours, which seemed harsh and out of the spirit of the Act. Since the distress and strain were apt to persist after the mother was up and about, she would like to suggest that the Act should extend until the child was weaned.

Dr. H. R. OSWALD agreed that there was no need for the term "newly born"; any interpretation beyond 24 or 48 hours made the word absurd.

Dr. REGINALD WORTH said that in his experience 75 per cent. of the women committed to Broadmoor for killing their children had done so during the lactation period, and that insanity occurring after childbirth was equally divided between the puerperium and lactation. If a woman killed her child during either period her confinement must have been a contributing cause. The emotions that a woman suffered during gestation could not be eliminated in a few hours. The period should extend until the child was weaned, and, since the mere fact of a mother, with her maternal instincts, killing her child showed that she was insane, it should be for the prosecution to prove to the contrary.

Prof. MCILROY, in reply, amplified Dr. Finucane's plea for the mother. Childbirth was so great an ordeal, even to the most normal woman, that its effects on the mind could not be classed with any other form of mental disorder. She read the following extract from a letter from Lord Justice Atkin, to whom she had sent a copy of her paper:—

"I agree with you that either the expression 'newly born' should be defined in time or the protection to the mother should extend as long as (perhaps within a time limit) she has not fully recovered and the balance of her mind is still disturbed. But this does not really affect the question of puerperal insanity unless the second alteration above is adopted and made wide enough. The kind of case you have in mind is exactly the class of case our committee were thinking of when we suggested an amendment to the law of criminal insanity of wholly uncontrollable impulse due to mental disease. The latter qualification would denote what you call insanity. The only criticism I have to make on your paper is that you seem to accept the Lord Chief Justice's criticism on this as possibly just, and then go on to prove that it isn't. The answer that may be made is that in practice, whatever the rules in the McNaghten case say, a woman such as you describe would be found guilty but insane. I think you may take it that this is generally true. Your juries and judges are often more humane than loyal, but it has always seemed to me to be a reproach to the law that it can ever be reasonable in practice only by being violated in theory. I hope in reply you can emphasise what you say in your paper: that in the case you refer to the woman knows what she is doing and knows that it is wrong but (*a*) does the act from an impulse which she cannot at all resist, and (*b*) is at the time insane or suffering from mental disease."

HUNTERIAN SOCIETY.

AT a meeting of this Society held on Feb. 27th, Mr. A. MORTIMER WOOLF, the President, being in the chair, Dr. ANTHONY FEILING delivered the Hunterian Oration on

SCIATICA: ITS VARIETIES AND TREATMENT,

a subject which was justified, he said, by the aggregate of suffering and disability lost through this common disorder. Unfortunately the term had been accepted by the public to designate almost any kind of pain in the region of the lumbar spine, buttock, hip, or leg, but sciatica should be thought of as merely signifying pain in the distribution of the sciatic nerve. It was convenient to speak of a secondary or symptomatic sciatica due to some gross pressure lesion and a primary or essential sciatica the exact ætiology of which was a matter of doubt and dispute. The part played by the fifth lumbar nerve in the production of symptoms was clinically important and was accounted for in part by its long oblique course to the plexus.

Secondary Sciaticas.

Secondary sciatica might be due to many lesions, including tumours of the rectum, pelvic organs, pelvic bones, or vertebral column; disease of the hip-joint, sacro-iliac joint, or joints of the lumbar spine; affections of the roots of the cauda equina, such as syphilitic inflammation; and the effects of old injuries and disease of the spinal cord—for instance, tabes. Physical examination must in all cases include the vertebral column, hip-joint, abdomen, nervous system, rectum, and sometimes pelvis. Gross pressure lesions were not common, but osteo-arthritis of the hip was often overlooked. Careful passive movement should not produce pain in the hip in true sciatica, nor should there be any real limitation of movement. Radiography was essential. The following symptoms should at once seriously invalidate a diagnosis of primary sciatica: pain extending to the anterior aspect of the thigh, perineum, groin, genital organs, abdomen, or abdominal wall; motor paralysis of leg or thigh or a dropped foot; loss of knee-jerk; marked muscular atrophy; reaction of degeneration in any muscles; severe vaso-motor disorders, œdema, or trophic ulceration; interference with the nervous control of micturition, defæcation or the sexual functions; lordosis or gross deficiency in the movements of the spine; and, finally, the history of an operation for malignant disease. Bilateral pain should excite grave suspicion, but it was possible for an essential sciatica to affect both sides.

Primary or Essential Sciatica.

Primary sciaticas were usefully divided into two groups: those where the symptoms suggested a true neuritis and those where the trouble seemed to lie in the region of the lumbo-sacral vertebræ. The true neuritis was an interstitial neuritis or perineuritis, and its precise ætiology was generally uncertain. This form occurred frequently in diabetic subjects. It was a good practice to seek and remove foci of sepsis, but the speaker confessed to little success from this line of treatment. The sensory functions were affected almost exclusively, presenting a strong contrast to the effect of pressure, where early sensory symptoms were soon followed by motor disturbances. Except in very severe or long-standing cases muscular wasting in primary sciatica was very slight and more or less global (i.e., affecting all the muscles of the limb equally). Kernig's sign would cause pain in many conditions where the nerve or its roots were affected by pressure or inflammation. The simplest test for real neuritis was tenderness on direct pressure, most easily elicited over the sacrosciatic notch and midway between the tuber ischii and the great trochanter. Sometimes it was also found in the popliteal space and over the external popliteal nerve on the head of the fibula. Mere discomfort was insufficient for diagnosis; the pain elicited must be acute. Another almost invariable sign of real neuritis was the disappearance of the ankle or Achilles jerk, often associated with exaggeration of the knee-jerk. The ankle-jerk might never return after an attack.

Juxta-vertebral Sciatica.

When secondary sciatica and true neuritis had been excluded there remained a large number of cases of uncertain nature, with practically no tenderness of the nerve and sometimes without loss of ankle-jerk. The pain tended to radiate, especially in the area of the fifth lumbar root; it was uncommon to find it on the sole or calf. The lesion was probably vertebral or juxta-vertebral. Scoliosis was often associated with sciatica, especially with the obstinate and chronic cases, and was most commonly of the contralateral type. With it were found rigidity of the lumbar spine, defective movements in all directions, and often a firm contracted condition of the erector spinæ. This form of scoliosis was due to a muscular reflex contraction, tending to produce enlargement of the intervertebral foramina on the side of the sciatic pain. When the scoliosis was homolateral, lessening tension on the nerve of that side, it was cured by saline injection into the nerve, suggesting that the lesion was probably a neuritis of the sciatic trunk. Much less common was an alternating form of scoliosis, believed by Putti to be due to bilateral arthritis of the lumbo-sacral joints, with need to rest first one side and then the other. Sicard classified neuralgic pains as due to lesions of the posterior root within the theca—"radiculitis," or between the ganglion and the origin of the nerve plexus—"funiculitis," or of the nerve plexus or trunk. Since funiculitis occurred in the intervertebral foramen, Sicard had coined the term "névrodocite" or "neurodocitis" of it. Apart from syphilis, herpes zoster, and spinal meningitis, the lesion within the subarachnoid space was not common. A unilateral neuralgia was more likely to be a funiculitis than a radiculitis, and in the latter a lymphocytosis of the cerebro-spinal fluid was found, while in the former there was a characteristic increase in protein without any increase in cells. This increase might be as much as 0·1 per cent. in sciatica. Putti [1] had made a useful distinction between "central" and "peripheral" sciaticas, the former due to vertebral lesions and the latter to neuritis or perineuritis.

Why is Sciatica Common?

The anatomical peculiarities of the lower lumbar region accounted for the frequency of "central" sciaticas. The last two lumbar intervertebral foramina were the smallest in the body and the fifth lumbar was peculiarly liable to congenital variations which might alter the size of the intervertebral foramen; it was, moreover, the "foundation stone" of the whole spinal column. Dr. Feiling had been unable to confirm Putti's statement that a spinal arthritis could always be demonstrated radiographically in central sciaticas. Even, however, when the sciatica had been ascribed to a lesion of the root or roots in the intervertebral canal the discovery of a cause for this arthritis was often hard. Foci of infection must be sought, and the possibility of an old gonococcal infection must not be forgotten.

Sacro-iliac Strain.

Dr. Feiling believed that disease of the sacro-iliac joint was a rare cause of sciatica, although minor inflammatory infections would be very difficult to detect. Hoyt Cox had distinguished two types of sacro-iliac subluxation, a traumatic and a postural form. In the second type, he maintained, sciatic pains were likely to be present, associated with undue prominence of the sacrum, rigidity of the spinal muscles, obliteration of the normal lumbar curve, lateral curvature of the spine away from the affected side, and marked tenderness on pressure over the joint. Trauma was not, however, confined to the sacro-iliac joint, said Dr. Feiling, and might well affect the lumbo-sacral spine and cause sciatic pain.

[1] THE LANCET, 1927, i., 53.

Muscular and ligamentous injuries might produce scar tissue with implication of nerve-fibres.

Treatment.

The treatment of the secondary forms was clearly that of the causal factor. In cases of neuritis or perineuritis rest in bed was nearly always essential, but splinting could seldom be tolerated. Heat was undoubtedly the best local palliative, whether achieved by poultice, fomentation, radiant heat, or diathermy. Ultra-violet rays were also useful. He had been little impressed by electricity. Milder cases might benefit from counter-irritation by liniments, ointments, or blisters, or by painting with strong hydrochloric acid. In the early stages of an acute neuritis massage was definitely contra-indicated. Innumerable drugs had been used, either as "cures" or to relieve pain. Any amenable condition, such as constipation or urinary infection, which might be a factor in causation, must be promptly treated. Salicylates and iodides had direct effect, but the intravenous injection of sodium iodide had no advantage over oral administration. Of analgesics dialacetin and allonal were of value, and particularly useful was a cachet containing aspirin grs. v., pyramidon, or amidopyrin, grs. v., and heroin, gr. $\frac{1}{4}$ or $\frac{1}{6}$. In really bad cases the temporary use of morphia was almost imperative. Cases of sciatic neuritis which did not yield in two or three weeks might be treated with saline injection into the nerve trunk; about 100 c.cm. should be used and the temporary pain controlled by a quarter of a grain of morphia. Injection of oxygen was also of value. Stretching the nerve by forcible manipulation was probably not of much use; in a very few highly intractable cases it might be justifiable to cut down on the nerve and freely incise its sheath longitudinally.

Great temporary relief in central sciatica might be obtained from epidural injection through the sacro-coccygeal foramen. Normal saline, novocain, or 10–20 c.cm. of a 40 per cent. solution of antipyrin might be used. This procedure, coupled with local application of heat, usually relieved most cases. Foci of infection must be treated and protein shock therapy had value. Putti was strongly convinced of the importance of immobilisation by a plaster jacket, later replaced by a celluloid corset, which was worn for 6 or 12 months. In chronic cases careful manipulation under an anæsthetic often gave relief.

EDINBURGH OBSTETRICAL SOCIETY.

A MEETING of this Society, with Dr. HAIG FERGUSON, the President, in the chair, was held on Feb. 8th, when Dr. D. M. LINDSAY (Glasgow) read a paper on the

Reduction of Forceps Delivery as a Basis for Prophylactic Gynæcology.

Internatal trauma affecting the birth canal was, he suggested, often due to the application of forceps; it might be visible to the naked eye or might be almost microscopical, and it was commonly a result of overstretching of the paracervical tissue or pubocervical fascia. Antenatal supervision should minimise the number of forceps cases, and in his opinion only those in which there was a medium amount of overlapping of the fœtal head at the beginning of labour would require forceps delivery. Use of the forceps would also be advisable in cases of occipito-posterior presentation in which manual rotation was impossible, and in those difficult cases in which there was resistance of the pelvic floor and marked narrowing or tenseness of the vaginal introitus. Dr. Lindsay believed that the standard indications for forceps delivery could be very much reduced in number; he did not think, for example, that the use of forceps was warranted in cardiac cases, in which Cæsarean section was much more satisfactory. Fœtal signs of distress were certainly definite indications for interference, but such interference was only permissible when the labour had progressed far enough to make delivery safe for the mother; he saw no benefit in delivering a debilitated child quickly when rapid delivery entailed maternal injury. The mother's safety should be the first consideration. In the treatment of primary uterine inertia Dr. Lindsay was opposed to the use of forceps, as delivery could often be effected by emptying the bowel and the bladder and by hot vaginal douching. In secondary uterine inertia the uterus required a rest; morphia was indicated in such cases and not forceps. Perineal rigidity might be treated by the administration of light anæsthesia, and in persistent rigidity such anæsthesia, and such expedients as fundal pressure or administration of pituitary extract often gave the necessary stimulus. Where forceps were necessary they should be applied in such a way as to prevent serious birth injuries, and it had been proved that they were only safe when applied in the biparietal diameters. He regarded the axis-traction forceps as dangerous, for when they were applied with the head in the oblique diameter of the pelvis the vagina was pulled taut and forcibly twisted as rotation of the head progressed. This often caused extensive vaginal lacerations. In Dr. Lindsay's opinion the best instrument to-day was the Kielland forceps. This was a long forceps, practically straight, the pelvic curve being almost negligible. Its application was always a biparietal cephalic one, no matter what the position of the head. It was smaller than the Milne-Murray forceps, it had no fixation screw and no axis-traction apparatus, and it was constantly under the control of the operator, who knew the amount of force being expended. There was much less compression of the child's head and (what was even more important) compression was always maintained in the safest cephalic diameters. If the high forceps operation was to remain at all in obstetric practice then the Kielland forceps was the ideal instrument. In conclusion, Dr. Lindsay condemned the use of forceps as a lever and as a rotator, stating that it should only be used as a tractor and considered as a compressor, the latter action being only utilised in the planes where it would be most efficient and where the compression would least damage the child. If this line of practice were followed it would be realised that the only safe forceps delivery which could be completed under the unfavourable surgical circumstances usually found in working-class areas was the low forceps operation.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee 54 cases were considered and £957 voted 49 applicants. The following are notes on some of the cases relieved.

Daughter, aged 67, of M.R.C.S. Eng. who died in 1895. She has been mentally afflicted since childhood. Lives with a sister aged 61, to whom the Fund gave a grant of £26 in December. An old lady lives with them and pays 10*s.* a week. Income of sisters £34 per annum each. The cottage belongs to them and rates amount to £2 4*s.* 8*d.* per annum. Voted £26.

Daughter, aged 44, of M.D. who died in 1908. Her father lost all his money in speculation, and applicant, though delicate, trained as a nurse, which profession she followed until she had a serious breakdown through war work. She has several times tried to resume work, but the doctor now says she will not be able to do so again. She is suffering from tuberculosis. Only income £40. Lives chiefly with friends. Voted £26.

Widow, aged 65, of M.R.C.S. Eng. who died in 1903. Applicant and her daughter lived together until the daughter, aged 37, was removed to a mental hospital; her income of £70 per annum has now to be used for her maintenance in the hospital. This leaves the applicant with only £26 per annum allowance from her sister-in-law who also pays the rent. Voted £26.

L.R.C.P. & S. 1883, aged 73, married, wife, aged 74. His one son, who is married and has one child, has started a small preparatory school. Applicant, who had to give up his practice two years ago on account of deafness, says, "I have outlived and exhausted my little capital." The friends with whom he and his wife live cannot afford to keep them for nothing. Only income old age pension £52 per annum. Voted £40.

L.R.C.P. & S., aged 92, widower. As a result of losing all his money had to start again to practise, and last year made £173. He is really too old to work now, but force of circumstances renders it necessary. He received gifts to the amount of £25. Interest on mortgages £68. Rates, &c., £23. Debts £61. Voted £40 in quarterly instalments and a special grant of £15.

Subscriptions may be sent to the hon. treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, W. 1.

Reviews and Notices of Books.

ACTINOTHERAPY.

Handbuch der Lichttherapie. Edited by W. HAUSMANN and R. VOLK, with the coöperation of O. BERNHARD, O. CHIEVITZ, F. M. EXNER, F. HAUER, K. HULDSCHINSKY, E. LANG, A. LAQUEUR, G. POLITZER, L. SCHÖNBAUER, J. SORGO, O. STRANDBERG, J. URBANEK, C. H. WÜRTZEN. Vienna: Julius Springer. 1927. Pp. 444. M.36.

THIS book presents in easily accessible form the work of some of the best-known continental authorities on actinotherapy. Since it is not a text-book on light treatment but a collection of valuable individual contributions, some repetitions and some contradictory statements are to be found. The section on light physics, energy measurements, and the discussion on recent work with photochemical and photoelectric methods will be helpful to those who are not familiar with this side of the subject. The biophysiological exposition is undertaken by Hausmann. Due stress is laid on the changes in the physical condition of irradiated proteins. In the section on metabolism, the point is made that although no change in total metabolism may occur, yet the study of the end-products of purin-metabolism shows that irradiation may influence some of the intermediate steps in the metabolism of animals. The diminution in blood-sugar and glycosuria in irradiated experimental animals and in diabetics is noted. In the pathological section some excellent microphotographs are reproduced showing the changes observable in irradiated skin. Strandberg contributes two chapters, one on general indications for light treatment and one on the treatment of laryngeal, nasal, and aural tuberculosis. The good results obtained by this pioneer worker in tuberculous laryngitis by general carbon-arc baths, sometimes combined with carefully timed local interference, are now generally accepted. Bernhard, whose work is also known to English readers, reviews in the chapter on light treatment in surgery the results obtained by heliotherapy in the High Alps. Chievitz writes on the same subject, and it is interesting to compare his results, obtained by actinotherapy in Copenhagen, with those of the previous writer. Huldschinsky appropriately contributes the chapter on light treatment in pædiatrics. He considers prophylactic irradiations of all infants an ideal which has so far received too little support from local health authorities. One of the most valuable contributions is that of Sorgo, who supplies a considered statement of the probable mode of action of light treatment in phthisis. He makes evident the analogy with tuberculin and with non-specific protein therapy, and explains in a convincing way the apparently contradictory results and statements on the subject. Absorption from the irradiated skin of a substance which appears to be specific, and which causes focal reactions, is regarded by him as one of the main factors in the light treatment of pulmonary tuberculosis. Urbanek writes on the treatment of diseases of the eye. This is a field which has not yet been fully investigated and his article forms a good introduction to the subject.

Altogether a most informative collection of articles.

Actinotherapy for General Practitioners. By H. G. FALKNER, L.R.C.S., L.R.C.P. Irel., L.M.Rot. Dub., Actinotherapeutist to the London Teachers' Association; late O.C. Maudsley Neurological Hospital, Denmark Hill; late Medical Officer of Health, Lynton and District (Devon). London: Baillière, Tindall and Cox. 1927. Pp. 152. 7*s.* 6*d.*

THIS book, the author tells us, has been written at the request of many of his friends and particularly those in the medical profession who, desiring more practical knowledge of the subject, were unable to obtain any book dealing with it in a concise practical manner. Considering the number of books which have been published within the last three years on the subject of actinotherapy, we should not have thought that knowledge would have been sought in vain. Dr. Falkner's book is one which may be useful to general practitioners, but he is not always explicit in his statements, as for example, on p. 79, we read "It can be safely said that all cases of rheumatism, acute and chronic, neuritis, sciatica, &c., will be benefited if not cured . . . . One often encounters a patient whom the ray does not benefit." The book closes with a summary of diseases which, in the author's opinion, are suitable for actinotherapy, and the appropriate dosage is suggested.

HANDBOOK OF DISEASES OF THE EAR.

Fifth edition. By RICHARD LAKE, F.R.C.S., Consulting Surgeon, Royal Ear Hospital; and E. A. PETERS, M.D. Cantab., F.R.C.S., Surgeon, Royal Ear Hospital, and Surgeon, Nose, Throat and Ear Department, Bolingbroke Hospital. London: Baillière, Tindall and Cox. 1927. Pp. 310. 12*s.* 6*d.*

THE revision of this, the fifth, edition of Lake's Handbook of Diseases of the Ear, has been undertaken by his colleague, Dr. E. A. Peters. The book has gradually increased in size, but has not outgrown the dimensions of a convenient little manual for students and practitioners. The plan of the book has not been changed, and, except for a brief description of the anatomy and physiology of the cochlea and labyrinth, the additions deal mainly with the details of description and treatment necessary to keep the work up to date. The excellent colour plates showing pathological conditions of the membrane tympani remain a feature of the book, and their colouring and printing has been improved. Attention may be drawn to a few points which might be reconsidered when revision for a further edition is contemplated. The statement that "in all cases of non-suppurative middle-ear disease all errors of structures in the nose should be corrected and any tonsillar tissue removed" is too sweeping, and does not take into account the harm done to the reputation of the specialty by useless operations on the nose and throat in incurable cases of deafness. In the description of paracentesis of the drum no recommendation of general, or indeed of local, anæsthesia is given, and no mention is made of the extreme, though transitory, pain of this operation. On the subject of mastoid operations, it is stated that "Schwartze's operation should be reserved for children," and is apparently not advised for acute suppuration in adults. There is a misprint on p. 184, where ℥ii is written for ℥ii. The book may be cordially recommended as an excellent handbook of otology of a size suitable for general practitioners and students.

APPENDICITIS.

By HUBERT A. ROYSTER, A.B., M.D., Surgeon to Red Hospital; Surgeon-in-Chief, St. Agnes Hospital, Raleigh, N.C. London and New York: D. Appleton and Co. 1927. Pp. 370. 21*s.*

THIS monograph is an attempt to present to the reader an account of present-day knowledge of a very common disease. An interesting historical sketch is followed by chapters upon anatomy and ætiology, after which come accounts of the pathology, symptoms, treatment, and prognosis, including a special section on the disease in children. The author does not seek to bring forward any one special view, though his own conclusions, the result of a large experience, are noteworthy, and make the book worth reading. He has not been so successful in dealing with other subjects. For example, his account of the technique of appendectomy under local anæsthesia on page 298 could not be followed by any surgeon without reference to other sources of information, and the directions are so scrappy as to make us doubt whether the author

has actually himself employed this method. The treatment of a residual abscess is a point upon which many a reader will desire information. It is dismissed on page 345 in a paragraph of six lines. We can find no description of the technique of opening a pelvic abscess by the rectum or vagina, nor any discussion of the relative merits of the approach by these routes as compared with that from above. The instructions for dealing with a subphrenic abscess on page 346 are very poor. As to chronic appendicitis the author quotes the views of many men, but finds himself unable, from published work or his own experience, to "lay out any detailed symptomatology—there is none." Yet he believes in the existence of a true primary chronic appendicitis; this is an unsatisfactory situation in which other surgeons find themselves, and one which renders the decision as to operative treatment extremely difficult. The section headed "When to Operate" contains the original recommendations of Ochsner and Murphy; the author's views on this subject appear to us sound. We do not approve his recommendation (p. 302) to use a long external rectus sheath incision for general abdominal exploration—it is too mutilating; but his method of enlarging the McBurney incision in case of need seems a good way out of an irksome situation.

JOURNALS.

GLASGOW MEDICAL JOURNAL CENTENARY NUMBER.[1]—Last week we alluded briefly to the appearance of the Centenary Number of our well-known contemporary, but more than a passing note of congratulation is due to an issue which reflects faithfully in its various chapters the progress of the medical profession alike in its scientific, literary, and material aspects.

The Centenary Number opens with a series of concise biographies of the editors of the *G.M.J.* throughout the centenary, the history of the journal which they conducted emerging in this way. The first editor was Dr. William Mackenzie, a well-known ophthalmologist and linguist, who early secured for his pages a group of distinguished contributors. He was shortly succeeded by Dr. William Weir, first surgeon and then physician to the Royal Infirmary and for a time lecturer in phrenology in the Andersonian Institution. With Dr. Weir, in each case apparently only for a short period of time, there was associated Dr James Lawrie, later Regius professor of surgery in the University and its first representative on the General Medical Council, and the exciting Dr. Andrew Buchanan, of whom the late Dr. Wallace Anderson wrote: "He wanted the tact, the discretion, the worldly wisdom of the successful editor"; but he evidently laid about him right and left, and in October, 1833, the journal came to an untimely but temporary end, not to appear again until 1851. On the re-issue Dr. William Weir returned as editor, a publisher-proprietor was found, and continuity for the rest of the period was maintained. Of the editors who followed many were, or became, distinguished figures in their profession, such as Dr. John Black Cowan, Dr. George Buchanan ("Wee Geordie"), Dr. William Leishman, the professor of obstetrics and father of the late Sir William Leishman, Dr. P. A. Simpson, and Dr. J. B. Russell. The appointment of the latter editor synchronised with the acquisition of the journal by the Glasgow and West of Scotland Medical Association, and Russell himself is famous for having built up the public health administration of the city. Russell was succeeded by Dr. Joseph Coats, Dr. Alexander Napier, and, among others, Dr. John Lindsay Steven, Dr. T. K. Monro, Dr. G. H. Edington, Dr. W. R. Jack, and the present editors, Dr. John Patrick and Dr. G. A. Allan. The biographies are adorned with portraits of many of their subjects, to some of whom a wealth of beard and whisker must have given an awe-inspiring appearance—we cannot imagine opposition to Dr. Andrew Buchanan being undertaken lightly.

[1] Glasgow: Alexander McDougall; London: H. K. Lewis and Co., Ltd. 5s. to non-subscribers.

A note from Sir Donald MacAlister on the medical school of the University from 1828 to the present day precedes fittingly a summary by Dr. Alexander Napier of the progress of therapeutics throughout the period; in this, while showing that the medical profession is to-day better equipped with weapons of precision for the acquisition of accurate knowledge, he lays stress upon the vista opened up to therapeutics by the discovery of the functions of the ductless glands and of the physiological action of certain of their extracts. Dr. G. H. Edington then exhibits the progress of surgery during the century by analysing the surgical contents of the first four quarterly numbers of the *G.M.J.* appearing in February, May, August, and November, 1828. The excerpts from these volumes give us a bird's-eye view of the state of surgical practice 100 years ago:—"disheartening for all concerned," he says, "were the conditions under which our predecessors worked—cramped as they were by the haunting spectre of sepsis and by the absence of skilled nursing." But the perseverance of these surgeons of old was such that, when light came with Lister, well-instructed and enthusiastic men were able to reap from the start much of the new advantages. Dr. R. M. Buchanan follows with a chapter on the evolution of bacteriology in relation to medical and surgical practice and preventive medicine, and here we find a résumé of the practical applications of bacteriology to the arrest of disease, to the development of sanitation, and to the rapidity and accuracy of diagnosis. Dr. A. K. Chalmers writes on the problems of medical administration in the early nineteenth century and later, and shows that Glasgow was among the first of the communities which helped to spread a knowledge of the protection against small-pox which vaccination afforded. The Faculty of Physicians and Surgeons of Glasgow in 1801 had instituted a vaccination station whereby an old obligation of the Faculty to visit the poor gratis, which had fallen into disuse owing to industrial conditions, was in a measure revived. This obligation played a part in the securing of the Charter of the Royal Infirmary, it being recognised that the physicians and surgeons had given gratuitous advice, assistance, and medicines to the poor of the city until a regular and daily inspection became needed, the population having outgrown the range of a monthly medical service. The summary of the incidence of the zymotic diseases and of the part which preventive measures have played in controlling them in the city of Glasgow makes further interesting reading.

More topical are a series of chapters by Dr. John Henderson describing the position of extramural teaching in Glasgow in 1828 and its progress during the century; by Dr. John F. Fergus on the Glasgow hospitals of a century ago; by Dr. E. H. L. Oliphant on the Royal Faculty of Physicians and Surgeons of Glasgow, in which full acknowledgment is paid to the history of the Faculty published in 1896 by Dr. Alexander Duncan, and bringing the record down to the middle of the last century. Dr. David Rorie, co-editor of the *Caledonian Medical Journal*, congratulates his Glasgow colleagues on the part played by them in a story of progress; he sends an amusing contribution on the hardships of the old Scottish general practitioner.

Articles on medical journalism are written by Dr. T. K. Monro, formerly joint editor of the *G.M.J.*, by the late Sir Dawson Williams, until a month ago the editor of the *British Medical Journal*, and by the Editor of THE LANCET. The first and last writers go over similar historical ground, while Sir Dawson Williams introduces to readers a medical journal *Medicina Curiosa*, published in England, which has escaped previous attention. Book-hunters will be encouraged to look for this publication among bound volumes of miscellaneous pamphlets, for there were only two issues—namely, in June and October, 1684—and only three copies appear to be extant, both issues being in the library of the British Museum, but only the first one in the library of the Royal College of Surgeons of England.

THE LANCET.

LONDON: SATURDAY, MARCH 3, 1928.

APPENDICITIS IN CHILDHOOD.

ELSEWHERE in this issue we publish a report of a meeting of the Royal Society of Medicine at which the Sections of Disease in Children and of Surgery discussed chronic appendicitis in children. Though it is doubtful, strictly speaking, whether such a condition exists apart from comparatively rare cases in which the appendix is attacked by tubercle or actinomycosis, or occupied by threadworms, the clinician is probably justified in using the term to include a group of cases with characteristic symptoms, regardless of whether he can elicit a history of a previous acute attack. This may have caused so little constitutional disturbance as to have passed unnoticed, or its significance may have been missed, and in practice it matters little what the process is called provided that the appendix is justly blamed for the symptoms. At any rate in childhood, the acute condition is more common than the chronic, and its incidence is said to be increasing. The same is apparently true of appendicitis among the population at large, and it is disquieting to note that the death-rate attributed to this disease has also been rising considerably during the last two decades. The increase in mortality is said to be even greater in America than in this country; thus Dr. J. O. BOWER [1] compares an increment of 7·3 per cent. in England and Wales between 1913 and 1923 with one of 22·3 per cent. in the United States in the same decennium. Whilst too much may easily be made of such figures, which can be explained in various ways, most observers who have studied them return with increased vigour to the familiar call for earlier diagnosis. There is evidently something wrong with our methods or with their application, and the discussion last Friday, though directed entirely to chronic appendicitis, may well lead to a general consideration of the disease in the group where its mortality is admittedly highest.

Children offer certain difficulties both in the diagnosis and treatment of abdominal disease, and though they are almost immune from gastric and duodenal ulcer, from gall-stones and visceroptosis, they none the less have their share of abdominal misfortunes and a good deal more than their share of deaths from acute appendicitis. In the adult, this condition has come to be regarded as an incident and such anxiety as still remains is as often financial as personal; in a young child, however, it is always a calamity and only too often ends in catastrophe. Seeing that in the so-called chronic appendicitis there is little need for anxiety, it may well be asked whether we cannot convert an acute case into a chronic. Such a change is undoubtedly desirable, and it seems logical to aim at what Nature often seems to accomplish unaided. But, unfortunately, the attempt can very rarely be made with safety. It is the common experience of surgeons that children bear abdominal infections badly and that an inflamed appendix in a child is often two days in advance of what the operator expects to find; localisation of the infection is less complete than in the adult and general peritonitis more common. It is not too much to say, therefore, that any delay is unjustifiable after diagnosing appendicitis in a child, and such delay becomes more dangerous the younger the patient and the more acute the condition. In practice the difficulty lies in making the diagnosis, and postponement of operation is only justified so long as this is in doubt. Pneumonia, pleurisy, pyelitis, acetonæmia and (perhaps most puzzling of all) the enteritis or colitis of "influenzal" outbreaks, will sometimes baffle the most experienced clinician for a time. It is at this period of heavy responsibility that the Murphy teaching holds out a friendly hand; rest in the Fowler position, no morphia, nothing by the mouth, and the free administration of glucose solution by the rectum will do everything possible to limit the spread of infection while the diagnosis is in doubt. Close watch must be kept on the local physical signs, the pulse-frequency and the appearance of the child, for any of these may vary from hour to hour and will sometimes point clearly to the diagnosis. More often than a leucocyte count a second rectal examination has given the information on which operation could be undertaken. The nature of this operation, when decided upon, is naturally a matter for the individual surgeon, and though removal of the appendix is the proper treatment, all rules are made to be broken, and there are times when even the most enthusiastic subscriber to the truth will content himself with drainage and leave the appendix to a later occasion. This two-stage operation is sometimes necessary in very young children and those in whom the appendix is deeply buried in the thick wall of an abscess, but the risks involved in prolonging the first operation in order to remove the appendix are often justified by the jeopardy in which the patient is placed if suppuration extends into or around the liver and a spreading peritonitis supervenes. Each of these methods—postponement and immediate removal—has its advocates, and deaths seem sometimes to be due to following the one plan and sometimes to following the other. After-treatment offers further questions for discussion, but there are few anxieties for those who follow MURPHY, provided they remember that morphia and mouth-feeding are incompatible, and that he who withholds fluids by the mouth shoulders the responsibility for giving an adequate, measured quantity by some other means.

If it is necessary to broadcast statements about the gravity of acute appendicitis in childhood, they should be accompanied by a declaration that castor oil is much more dangerous than constipation. "Bilious attacks," particularly when abdominal pain is followed by vomiting, are often signs of appendicitis, and with such symptoms castor oil does everything which we most wish to avoid. The nursery medicine cupboard is no place for such a dangerous drug. Where the practitioner is in doubt of the diagnosis he will be wise to order the Fowler position and Murphy treatment while he is making up his mind; and it is always preferable to get surgical advice too soon rather than too late. Such is the preventive surgery of appendicitis.

[1] Amer. Jour. Med. Sci., 1927, clxxiv., 225.

THE EDINBURGH BILL.

WHICHEVER way it may be determined by Parliament, the controversy over the Edinburgh Corporation Bill will have a wholesome educative effect. As our readers are aware, the Bill is aimed at the person who defaults from his treatment for venereal disease before he is fully cured and while he is still liable to infect others The medical officer of health is to be authorised to serve defaulters with a notice requiring them to consult a medical practitioner or attend treatment, and (unless they produce a certificate from the medical practitioner declaring them free from venereal disease) to undergo treatment until certified cured or unlikely to cause infection. This is not the whole of the Bill. If it is reasonable to require defaulters to complete their treatment, it is equally reasonable to require that persons who have not even begun treatment shall submit themselves thereto.

The Edinburgh Bill therefore provides that the medical officer of health may serve a similar notice upon any person whom he has reason to believe to be suffering from venereal disease and liable to infect others, if such person neglects or refuses to undergo treatment by a medical practitioner or at a treatment centre. Where the patients are under 16, these notices may be served upon their parents or guardians who are to be responsible for carrying out what the notice requires. So far, it will be seen, there is no conspicuous breach of the rule of professional secrecy; the matter is in the hands of the medical officer of health. It is on the next step in the Bill that the issue of secrecy is mainly raised, though the step is one not likely to be taken until after exhausting every effort to apply pressure on the patient to undergo treatment voluntarily. This step is the provision of machinery for securing the removal of a patient to hospital and his detention there if the medical officer of health certifies that he is suffering from venereal disease and is liable to infect others and that his removal and detention is expedient in order to prevent the spread of infection. The order for removal and detention may be made by a police-court either upon production of the certificate or upon adequate medical evidence of the necessity and desirability of making such an order in the public interest. The application for an order and the giving of medical evidence in the police-court are incidents which potentially jeopardise the principle of absolute professional secrecy. But there is to be no public disclosure; the Bill insists that all applications shall be heard in camera; it excludes from the court all persons except the patient, the medical witnesses, and the legal representatives. Those who cherish unqualified views of the inviolable liberty of the subject will no doubt dislike the element of compulsion in the Bill; they will also attack the further clause which would allow the medical officer of health to require parents to be medically examined and to undergo treatment if necessary where a child under 16 is found to be suffering from certain specified diseases of syphilitic or gonorrhœal origin. Defence of the liberty of the subject and defence of medical secrecy are two different matters. The medical profession is not so intimately interested in the former as in the latter. Liberty to spread a dangerous infection makes no strong appeal. If it were not for the question of secrecy, doctors would, we believe, have little hesitation in supporting the Bill. The Trevethin Committee (on which medical interests were well represented) recommended that the experiment of special measures for dealing with defaulters should be allowed for a limited time in a particular area where a case for such measures had been made out. Undeniably the City of Edinburgh has a strong case. It has in operation an admirably equipped scheme; it has been more successful in dealing with defaulters than any other part of the country. If it finds that nevertheless its defaulters average 1000 cases a year, it is justified in making some further attempt to reduce their numbers, to remove a public danger, and to avoid a disheartening waste of medical effort and public money.

Extreme insistence upon the merits of medical secrecy is, in our opinion, appropriate in protesting against the obligation to disclose a patient's confidences in open court—for example, in the course of divorce proceedings. We see no reason why the doctor should not be allowed to claim the same privilege in the witness-box as barristers and solicitors enjoy. But the supporters of the Edinburgh Bill are entitled to point out that the consequences of disclosure are vastly different when the proceedings take place behind closed doors and are unreported. The duty of secrecy may have to be weighed against other and possibly conflicting duties. Moral or legal, the duty to refrain from exposing others to infection is not merely a matter of venereal disease. If a medical practitioner would take strong action to prevent a thoughtless parent from sending to a public school a boy suffering from mumps or measles, is not equally strong action justified to prevent a venereal disease defaulter from spreading infection? The developments of recent decades have not been without their influence upon professional traditions. A system of State health insurance has introduced a third-party element into the old relationship of doctor and patient. The compulsory notification of infectious disease has meant another modification of ideas. Parliament has even (in the Bradford Corporation Act of 1925) made the experiment of applying notification to venereal disease in the case of grown-up persons who refuse or default from treatment and in the case of infant children. Do practitioners in Bradford find the existence of this statutory provision incompatible with their professional conscience? The Edinburgh proposals differ in character from the Bradford precedent, but the Edinburgh and Bradford provisions are alike in possessing a certain latent value, even if left inoperative. Medical officers of health will welcome the right to exercise such powers even though no medical practitioner is ever called into the witness-box. Critics may insist that, in the battle against venereal disease, no sharper weapon is to be used against the defaulter for fear of infringing the abstract principle of professional confidence. But they are incurring a grave responsibility towards posterity.

THE PHYSIOLOGICAL SOCIETY.

ON March 20th, 1926, the Physiological Society completed the first 50 years of its existence, though the jubilee celebration was not held till the following year, and to mark this memorable occasion Sir EDWARD SHARPEY-SCHAFER was requested to compile a history of the Society. This task he has now completed, and the history is published as a supplement to the *Journal of Physiology* for December, 1927. It is a volume of extraordinary interest. Glancing through its pages one might almost imagine it to be a "Who's Who" of modern British medicine instead of the domestic history of a single branch of medical science. Great names in medicine, surgery, pathology,

bacteriology, and biochemistry appear on every page, and it is abundantly clear what an important part the Society has played, and what a powerful influence it has exercised in the development of medical science. The British School of Physiology is so famous that it is difficult to realise that it is of comparatively recent growth. In the middle of the nineteenth century the country which had produced WILLIAM HUNTER seemed to be no longer interested in the exact study of the functions of the human body. While BERNARD, MAJENDIE, MÜLLER, HELMHOLTZ, and LUDWIG were pursuing their brilliant investigations in France and Germany, in this country the teaching of physiology was carried out by surgeons and physicians, busy with their private and hospital practice, and the science of experimental physiology did not exist. But in University College, London, WILLIAM SHARPEY, who was professor of general anatomy and physiology, realised the importance of the study of function. He himself was not an experimentalist, but he had the vision to appreciate the fundamental importance of the experimental method, and he induced MICHAEL FOSTER, a former student of University College and hospital, to give up practice and to return to the College as professor of practical physiology. The teaching of physiology at University College, elementary though it was in its early days, soon began to exercise a profound influence in the other London schools. Not only was the teaching improved, but independent workers were encouraged to carry out investigations for themselves. Most of them, like PAVY, were engaged in active clinical practice, but others, under SHARPEY's influence, forsook clinical work and devoted themselves wholeheartedly to the laboratory. BURDON SANDERSON was one of these, and when in 1870 FOSTER was appointed on the suggestion of HUXLEY to the newly instituted Prælectorship of Physiology in Trinity College, Cambridge, SANDERSON succeeded him in the chair of practical physiology at University College. The foundations of British physiology had been well and truly laid by SHARPEY, and MICHAEL FOSTER at Cambridge and BURDON SANDERSON at University College proceeded to develop the two great schools of physiology which exist in undiminished vigour to this day.

In all branches of human activity the need is felt, sooner or later, of some organisation by means of which workers in similar fields may be brought together to their common advantage, and there is no doubt that the Physiological Society would eventually have been formed. But it is interesting to note that physiologists were actually driven to form an association to protect themselves and, what was more important, the science to which they were devoted. The growth of experimental physiology and pathology necessitated experiments on living animals. Before long a widespread agitation against vivisection sprang up, and a Royal Commission was appointed to investigate the subject. This was obviously only the preliminary to Parliamentary action, and it became essential that those interested in experimental biology should place themselves in a position to guard the interests of scientific medicine. BURDON SANDERSON invited the most prominent physiologists of the day to meet at his house to discuss the matter, and suggested in his letter of invitation the formation of the Society: "It will probably also be proposed at the meeting to form an association of physiologists for mutual benefit and protection." This suggestion was acted upon, and from this meeting of 19 men has grown the Society which now has a membership of upwards of 400. Sir EDWARD SHARPEY-SCHAFER was one of the original founders, and we can well understand that the compilation of this history has been to him, as he says, a real labour of love. The extracts from the minute books are full of interest and have a personal touch which is, indeed, characteristic of the Society. Particularly happy are the numerous biographical notes. SIMS REEVES attended one of the meetings, but "it is not recorded whether he obliged the Company with a song." During the same year it was resolved that the number of ordinary members should be increased from 40 to 50. The number is now unlimited, and the original rule that every member should be a working physiologist has been abandoned, though it is noted in 1925 that some of the meetings were so largely attended that members had difficulty in seeing the demonstrations. Women were admitted to the Society in 1915 by a fairly substantial majority on a post-card poll, though it is curious to note that their presence was more welcome in the austere atmosphere of the laboratory than in the more social surroundings of the refectory. In 1916 the Society decided to publish *Physiological Abstracts*, and in 1926 it assumed control of the *Journal of Physiology*.

Enough has been said to indicate the profound interest of Sir EDWARD SHARPEY-SCHAFER's compilation, and not only the Society, but the whole of the physiological world must congratulate him on an achievement which could not have been carried out by anyone else, and which called urgently for performance.

Annotations.

"Ne quid nimis."

MUTABILITY OF PNEUMOCOCCAL TYPES.

IT has long been known that certain species of bacteria, such as the meningococci and pneumococci, can be subdivided into serological types, and it has also been recognised that these types are more or less specific serologically, and from a therapeutic point of view necessitate the use of monovalent sera if the best results are to be obtained. What these differences mean and what the relation of one type to another may be is far less clear, but recent investigations of the serological types of pneumococcus, by Dr. F. Griffiths,[1] have thrown a certain amount of light on this obscure question and given results of considerable significance in other directions. Some time ago Griffiths found that the effect of growing pneumococci in immune serum was to produce so-called "rough" strains, which are avirulent and have lost their serological identity. He now finds that it is sometimes possible to restore these properties to the organisms by passing them through the animal body. This is a result by no means easy of achievement, since these attenuated types have little ability to establish themselves in the living animal; but it was discovered that the reversion to virulent type took place much more readily if a considerable mass of dead culture of pneumococcus was inoculated along with the living organisms. This suggests that there are certain constituents of the dead cocci which the living ones are able to metabolise and which are essential for their virulence, and pursuing this line of investigation in greater detail Griffiths found that pneumococci whose virulence was restored by this manœuvre assumed the type of the dead organism, instead of reverting to their own original type. Thus a rough form of Type I. inoculated with a dead culture of Type II. became transformed into the ordinary Type II. These phenomena seem to show that in the attenuated "rough" state the organisms are unspecialised and are capable of developing into any of the virulent fixed types according to what environmental conditions or pabulum

[1] The Significance of Pneumococcal Types. By Fred. Griffiths, M.B., Journal of Hygiene, 1928, xxvii., 113.

may dictate. The possible importance of these findings is more than academic, for it suggests not only a mechanism by which the virulent types may spring into existence from more lowly vegetative forms, but also a way in which the virulent organisms may disappear in the course of recovery and convalescence. It has commonly been assumed that in the latter condition the organisms died out, but there are difficulties in the way of universal acceptance of this view, and Griffiths's demonstration that in the presence of immune bodies organisms may mutate into an undistinguished form, suggests that an old and rather despised view, that they may lose virulence instead of dying out, may after all be correct.

THE WAR ON RATS.

Is a world war against rats worth while? The Danes and the other Scandinavian countries evidently think so, judging from a recent communication to the French Academy of Medicine by Dr. Gabriel Petit, in which he describes the dogged and successful fight put up by Denmark, and announces an international conference to be held this summer in France. The Danish effort began in 1898 with the formation of a national society and a demonstration of rat destruction in Copenhagen and Frederiksberg (virtually one town) on the premium system. This was imitated in 1900 by the Japanese, as the result of an outbreak of plague, and by other countries. France made a law in 1903, which was, however, limited to shipping. In 1907 the first Danish rat law imposed on district councils the liability of paying from ½*d*. to 1*d*. for each dead rat, and in three years nearly four million rats were killed at a cost of half a million shillings. As Dr. Petit points out, this was a profitable transaction, seeing that it does not take a rat long to eat and waste a shillingsworth of grain. As the rats grew scarce the small premium became less attractive and attention was turned to other methods of destruction. The second law (1910) left the choice of the method of destruction to the 1200 parishes, and during its five years' operation about 1½ millions of rats were destroyed at a price of 200,000 shillings. This rate of destruction was perhaps only sufficient to counterbalance the natural increase of the rat population. The world war caused a lull, but outbreaks of plague in Stockholm in 1919, and in Paris and Marseilles in 1920, revived interest in the matter among the Scandinavians. A third Danish law in 1921 put obligations on seaports to take energetic measures, and also established a general crusade. Every owner of property became liable to a penalty for failure to conform. The cost of the scheme fell on the district councils, and a Government subvention of 40,000 crowns was paid, partly as an encouragement, partly for dealing with public property. "Ratin," a bacterial poison of the paratyphoid group, and "ratinin," a preparation of *Scilla maritima* (*rubra*) became the accredited poisons. This time remarkable success crowned the enterprise, and when the third law came up for renewal in 1924 it was replaced by a permanent law, applying not only to ports, but to all towns and commercial establishments in Denmark, and the Government subvention was increased to 60,000 crowns. The Royal School of Veterinary Science and Agriculture was put in control of the methods of destruction. Dr. Louis Bahr, of Copenhagen, formerly assistant to Prof. C. O. Jensen, Director of the State Veterinary Service of the Serumtherapy Institute of the Royal School of Agriculture and Veterinary Science from 1906 onwards, has been responsible for the production of "ratin" and for seeing that its virulence is kept at a high pitch. As the result of the use of "ratin" it is estimated that at least 80 per cent. of the rats die within 8 to 15 days from enteritis or septicæmia and that, if destruction is not complete in three weeks, the standardised preparation of squill, which kills in 24 hours, will account for the remainder. It was in the year 1902, at a shipping congress in Copenhagen, that the International Society for the Destruction of Rats was formed, with Mr. Zuschlag, the enthusiastic founder of the Danish Society, as first president, and Dr. Loir, one of the French delegates, as vice-president. The outbreak of the world war prevented the proposed international congress in Copenhagen in 1914, so that the French International Congress of 1928, with sessions at Paris and Havre, may be regarded as a resuscitation of international effort. The seaport of Havre, with Dr. Loir as the president of its Bureau of Hygiene, has for many years been very active in the rat campaign.

In this country a useful booklet on the subject by Mr. A. Moore Hogarth has recently been issued; it is called "Rats and How to Kill Them."[1] The same house published in 1924 a very complete and authoritative work on this question, entitled "Rats and How to Destroy Them," dedicated to Lord Aberconway and Sir James Crichton-Browne, as two men who had specially drawn attention to the rat menace. The author, the late Mr. Mark Hovell, F.R.C.S., showed the need for a much more complete scheme in this country, under scientific direction, and conducted by the larger local governing bodies. The book is a mine of information. The author refers to the diseases other than plague which are spread by rats and to the enormous damage to our food-supply from their depredations. He shows that a pair of rats will eat or waste 5 lb. of flour in a week, that a moderate estimate puts the rat population of the country at 40 millions, and that the damage done runs into millions and may be as much as £1,000,000 a week. As a maritime country, we should be specially interested in a world scheme for rat extermination. In concluding his paper to the French Academy, Dr. Petit quotes Prof. Calmette, who, after praising the Danish effort and making reference to the risk to health and the damage to wealth from rats, said: "Such misdeeds clamour for reprisals. We can no longer tolerate the ravages of rats. Against the serious and continuous menace from their activity, cunning, and fecundity we must pit our brains, our determination, and the scientific weapons we know how to forge for their destruction. Let us unite internationally our forces and munitions of war."

CHRONIC INFECTIONS OF THE SEMINAL TRACT.

Two papers were published at the close of last year which, under different titles, dealt primarily with the treatment of chronic infections of the seminal tract. The first of these was a paper by W. T. Belfield and H. C. Rolnick, in the December number of the *Journal of the American Medical Association*, entitled Observations on the Physiology of the Seminal Duct, and the second one by Georges Luys, in the *Bulletin* of the Société des Chirurgiens de Paris. In dealing with the physiology of the seminal tract the American authors first discuss the function of the epididymis. Why should the human spermatazoon, whose length is only 1/500th of an inch, be forced to traverse a tract of 20 feet—that is to say, of more than 100,000 times its own length—before it reaches its destination? The fact that in quadrupeds the seminal vesicles, if they exist, are solid glands that open directly into the urethra, suggests that the epididymis, which is always well developed in these animals, acts as a reservoir for the storage of spermatazoa. From this it is logical to deduce that it performs the same function in man; this is certainly not its only function. "During the mating season of snakes, birds, and mammals, the epididymis increases greatly in bulk, its tiny cells become larger and more numerous, and the volume of these greater; with the passing of the mating season its bulk and secretion subside to the ante-nuptial dimensions." The provision of a secretion is, therefore, an integral part of its function. The exact nature of this secretion is still unknown, but the chemical analysis of the aspirated contents

[1] John Bale, Sons and Danielsson, Ltd. 6*d*.

of spermatoceles suggests that it is the epididymis that is mainly responsible for the secretion of the proteins that are found in the semen. Belfield long ago called attention to the fact that the epididymis, like other secretory glands, is capable on occasions of acting also as an organ of excretion. This is proved by the fact that when dyes, such as methylene-blue, mercurochrome, and silver arsphenamin, are injected intravenously into dogs their colour appears in the body of the epididymis, leaving the head uncoloured. An obvious corollary to this is the possibility of influencing infections of the seminal tract by means of intravenous therapy. In the latter half of their paper Drs. Belfield and Rolnick describe cases of non-tuberculous seminal infection which yielded promptly to intravenous injections of neoarsphenamin or sulpharsphenamin. They therefore urge that cases of chronic prostato-vesiculitis, complicated or uncomplicated by arthritis or secondary iritis, should be treated by such means before resorting to surgical therapy.

Dr. Georges Luys, in his paper on catheterisation of the ejaculatory ducts, tabulates the indications for catheterisation under the following headings: stricture of the ejaculatory ducts; distension of the vesicles uninfluenced by prostatic massage; pain after ejaculation; hæmospermia; ejaculation without projection; congenital strictures; repeated attacks of epididymitis and azoöspermia due to obliteration of the ejaculatory ducts. He furnishes details of the technique of catheterisation with the posterior urethroscope that bears his name. Whilst admitting the difficulty of the operation and its impossibility in certain cases, he considers that the procedure may sometimes be feasible after careful treatment of the verumontanum by diathermy. The cauterisation of an œdematous and hypertrophied verumontanum will often render obvious ejaculatory ducts that were previously invisible. Whilst this method of treatment may be of great service, it must be carried out with restraint, as otherwise more harm than good may result.

THE OPIUM QUESTION IN PERSIA.

PERSIA is both a large producer and a large consumer of opium, and the problem which it presents in face of both The Hague and the Geneva Opium Conventions is a complicated one. Dr. A. R. Neligan deals with the subject [1] in the way that would be expected from one who has lived 20 years in that country, who was until recently physician to the British Legation at Teheran, and who has studied sympathetically and critically the medical and economic aspects of the use and abuse of opium among the Persians.

The cultivation of the poppy and the internal and external trade in opium are closely interwoven with the social and commercial life of the people of Persia, and a restrictive policy, applicable alike to production and consumption of the drug, is confronted by many difficulties. Some 600 tons of opium are produced annually in Persia and the money value thereof is about £2,000,000 a year, while the Government derives 9 per cent. of its revenue from opium. Half of the total output is exported, mostly by way of the Persian Gulf, and largely to the Far East. Persian opium had at one time a high repute for pharmaceutical purposes, by reason of its rich morphia content, but it is maintained by the Government that Persia at the present time supplies less than 1 per cent. of the opium used for the preparation of morphia, heroin, and medicinal opium. Nevertheless there are some 70,000 acres under the poppy in Persia, some 300 tons of opium are consumed annually in the country, while 10 per cent. of the people are opium-smokers and one-fourth of the inhabitants of Ispahan are engaged, directly or indirectly, in this lucrative industry. If the figure postulated by the League of Nations as representing the medical or legitimate quantum of opium—viz., 12 lb. per annum per 10,000 of the population—be accepted, it appears that in Persia the consumption is at the rate of 459 lb. per annum per 10,000. If Persia, which signed, under reserves, both The Hague Opium Convention of 1912 and the Geneva Convention of 1925, but has ratified neither, is to be levelled up to the prescribed standard, it is obvious that there is much to be done.

The Commission which was recently sent by the League of Nations to investigate the special case of Persia reported on the financial aspects of the question and the possibility of substituting other crops for those of the poppy. The Persian Government has retorted that before doing so it must secure financial autonomy and control of customs tariffs, and urges that if it is to be rationed in regard to opium production the same restrictions must be applied to other producing countries as well as to those which cultivate the coca plant. The Government has, however, intimated a willingness, in due course, to reduce opium production by 10 per cent. annually for three years and then, in the light of the experience gained, to consider the effect such curtailment shall have had on the national budget, the trade balance, and the opium farmers respectively. Dr. Neligan, while fully recognising the magnitude and difficulty of the economic problems thus raised, is convinced of the physical and moral evils resulting from the non-medical use of opium. He thinks the abuse has increased greatly in recent years and is still increasing. He has observed the incompetence and slackness in men, women, and children from the abuse of the drug, and has witnessed the sapping of physique and moral in its addicts. He thinks that opium takes a tighter hold upon its victims than other narcotics, cocaine excepted, that moderation in its use is more difficult, and that, while it does not occasion the same organic lesions as alcoholism, its effects are definitely more weakening, especially on the moral side. In view of the exaggerated assertions of partisan writers it is well for serious students of the opium problem to read Dr. Neligan's able and reasoned statement.

[1] The Opium Question, with Special Reference to Persia. London: John Bale, Sons and Danielsson. 1927. Pp. 84. 5s.

CONGENITAL CATARACT.

ONE of the most unsatisfactory conditions that come to ophthalmic surgeons for treatment is the dense lenticular opacity sometimes present at birth. It is much more difficult to deal with than lamellar cataract, which is more common and seldom present at birth, being first found, as a rule, at a period of infancy when the child has had ample time to acquire the art of central fixation. True congenital cataract, when dense, makes central fixation impossible, and when, as is nearly always the case, it is bilateral, it gives rise to a permanent nystagmus, unless a successful operation or series of operations removes the obstacle to central fixation at an early age. The disadvantages of operation in very early infancy are obvious, and since congenital cataract is always a developmental defect and may be only one feature of a faulty growth—the eye may be micro-ophthalmic for instance—useful vision cannot be guaranteed even after apparently successful operative treatment. Cases first operated on at a later period are almost sure to be vitiated by nystagmus. A considerable proportion of the inmates of blind schools are children who have been operated on for congenital cataract, in some cases with apparent success, as far as the technique is concerned, but who display a decided nystagmus which reduces their vision, even with correcting lenses, to a point lower than that necessary for them to earn their living in ordinary ways. Further disadvantages of the accepted treatment of these cases have recently been pointed out by Dr. L. Webster Fox, of Philadelphia.[1] He suggests that there may be deleterious allergic reactions during the periods when the lens matter is being absorbed in the anterior chamber after each needling and he remarks on the danger of causing adhesions between the vitreous and the cornea (a

[1] Jour. Amer. Med. Assoc., Dec. 31st, 1927.

danger which could be avoided by entering the needle through the limbus). There is the further inconvenience, which in infancy may be prohibitive, of wearing spectacles with heavy lenses. As an alternative to needling he strongly advocates an optical iridectomy, in a single operation on each eye, which is comparatively easy to perform. This is frequently done in this country, both in cases of true congenital and of lamellar cataract, but it is only applicable when, with a dilated pupil, there is sufficient clear lens matter to form a fairly good peripheral pupil. The most important thing, from the point of view of the family doctor, is to decide at what period of infancy an operation should be undertaken. On this subject there appears to be some lack of agreement among authorities. Most would say as early as possible, and Fuchs says during the first few weeks of life.[2] Turok and Grout, in their text-book, say as early as the fifth month,[3] but Mr. Treacher Collins advises not earlier than the tenth month. "At an earlier age," he says, "the cornea is so small and the anterior chamber so shallow that the necessary instrumentation cannot be so satisfactorily carried out as in a more fully developed eye. Moreover, the amount of aqueous humour is so small that it does not suffice for solution of the liberated lens substance." For the pathology and treatment of the different varieties of this condition we can think of no guide so good as the article from which the above extract is taken.[4]

THE SO-CALLED PEMPHIGUS OF THE NEW-BORN.

THE Central Midwives Board, after an experience of nearly a quarter of a century, has come to the conclusion that the verbal description of pemphigus supplied to midwives fails to carry an accurate picture of the disease to those who read it. The Board is therefore circulating to all midwives a pamphlet with the best coloured drawing that could be obtained. The plate is taken from the fourth edition of the "Atlas of Dermochromes."[5] The little booklet accompanying the plate points out the importance of strict surgical cleanliness and draws the midwife's attention to the rule compelling her to send for medical aid at once, as well as to notify infection to the local supervising authority, and to disinfect herself. Pemphigus of infants is quite unrelated to pemphigus of adults and is a grave coccal infection of the skin which frequently ends in death from septicæmia. It has, however, some obvious relation with the impetigo contagiosa and septic sores of various kinds from which the nurse, midwife, or other member of the family may be suffering. In a recent paper[6] Dr. H. W. Barber points out that the characteristic lesion of impetigo is a blister varying in size from a pin's head to a hen's egg. It is formed just beneath the horny layer of the skin and is due to the outpouring of serum from the superficial vessels. The blister becomes secondarily invaded with staphylococci, and soon become turbid. There is, however, some evidence that the eruption may sometimes be due to *Staphylococcus aureus* in the first place, and it is possible that a virulent coccus might, in the virgin soil of a new-born baby's skin, cause lesions of a different type from those seen in older children. The size of the blister depends on the situation in which it arises. Where the horny layer is thin, as on the face, it is soon ruptured; where it is thick, as on the palms and soles, the blister may reach an enormous size. The *pyogenes longus* type of streptococcus is usually benign, but in new-born babies is very serious, probably because the infant has no acquired immunity. The point to remember, says Dr. Barber, "is that pemphigus neonatorum has nothing to do with true pemphigus or with syphilis; it is contagious impetigo of the large blister or bullous type occurring in early infancy." When these facts are taken into consideration it is obvious that no person with active pyogenic infection of the skin should ever handle an infant. Dr. Barber relates a story of a medical man with chronic impetigo who had consulted him, and who told him that three babies in his practice had recently developed pemphigus.

Modern evidence is, in fact, entirely in favour of identifying this disease with impetigo contagiosa. As long ago as 1909 F. Foerster, after giving numerous instances of its infectivity, has stated categorically, "there now appears to be sufficient evidence at hand to warrant insistence on the proper recognition of pemphigus neonatorum as simply a bullous infantile variant of impetigo contagiosa and elimination of the confusing term *pemphigus* when this affection is under discussion." Yet the term pemphigus has remained in use up to the present day. It is true that syphilis sometimes, though rarely, produces blebs in the new-born, but so does the acarus of scabies, and if an ætiological foundation is to be the ultimate aim of nosology, it seems a mistake to continue to use a name which, as all authorities are agreed, ignores the experimental and clinical evidence of years. The origin of the name appears to be lost in antiquity. Dr. Edward Rigby, in the *Medical Gazette* of 1835 (p. 125), used the term "pemphigus infantilis," and in his text-book dated 1794 F. B. Osiander speaks of "pemphigus neonatorum s. connatus." Foerster states that the disease was first described by J. A. Oehme in 1773.

[2] Fuchs-Duane Text-book, eighth edition, p. 643.
[3] Surgery of the Eye, second edition, p. 206.
[4] The Ophthalmoscope, August and September, 1908.
[5] Jacobi-MacCormac Atlas of Dermochromes. Fourth edition. London: Wm. Heinemann (Medical Books), Ltd.
[6] Maternity and Child Welfare, 1927, xi., 378.

HYPOGLYCÆMIA IN SCLERODERMA.

WITH the development of biochemistry and the progress of knowledge in the obscure domain of endocrinology there is a growing and healthy tendency for a closer coöperation between the general physician, the dermatologist, and the laboratory worker for the purpose of attack on pathological problems. Among these, although fortunately it is a rare disease, there is none more striking than the complex of symptoms termed scleroderma. The various types of localised and diffused varieties have at least one symptom in common—the thickening and induration of the skin—but many of them are associated with prodromal manifestations that remind one of Raynaud's disease, or with abnormalities of pigmentation, sensory disturbances, and general asthenia which may recall the later stages of Addison's disease. It was presumably this latter syndrome which has led to the belief, both in this country and on the continent, that a disturbance of endocrine function was an ætiological factor in scleroderma. The theory seemed to receive a certain measure of support from the symptomatic improvement that follows the administration of thyroid gland extract in some cases, and this line of treatment is nearly always prescribed. It is, however, doubtful if thyroid can exercise a specific effect, for the failures are much more numerous than the cures. In his scholarly report from the medical clinic of the Johns Hopkins University Dr. W. T. Longcope[1] has brought forward evidence which tends to show that the endocrine disturbance is more probably a secondary than a primary phenomenon in the evolution of the disease. In one fatal case of acute scleroderma in a young man the autopsy revealed atrophy of one suprarenal gland and interstitial orchitis. The author's view is that the interstitial changes observed in the skin in every case are by no means confined to that organ, but can be demonstrated in the connective tissue and blood-vessels of the other organs. Such a process extending into a suprarenal or thyroid gland must affect their functions and accordingly lead to disorders of pigmentation, asthenia, alopecia, and low blood pressure, such as are commonly associated with the disease under discussion, as they also are with Addison's disease. This explanation readily accounts for the uncertain action of thyroid gland administration,

[1] Jour. Amer. Med. Assoc., Jan. 7th, 1928.

and the author uses it ruthlessly to explain the hypoglycæmia he discovered in one of six cases described. He points out that the fasting blood-sugar is also low in Addison's disease, as Porges first described, and that the other symptoms of that condition bear a close resemblance to those of scleroderma. If nothing very positive has emerged from this report, it will at least create fresh interest, and lead us to regard with scepticism the almost accepted ætiology of scleroderma on an endocrine basis.

TUBERCULOUS INFECTION IN INFANCY.

USEFUL information has been obtained from an investigation [1] entrusted to Miss M. A. Asserson by the New York Tuberculosis and Health Association. The three-fold object was to ascertain the incidence of tuberculosis among groups of infants in a large city, to determine the relation of exposure to infection, and to discover what was the significance and course of infection in very early life. The procedure adopted included a study of hospital and clinic records, covering a period of five years, of all infants who had been treated at two hospitals for various ailments and who had had routine tuberculin skin tests at the time of their admission. Skin tests were also employed to determine the incidence of infection among the general infant population, being carried out both at clinics and at health stations. It was found that in the hospital group 8·2 per cent. of cases (excluding those with tuberculous disease) gave a positive result, whereas the percentage at the clinics was 4·5 and among the healthy babies at the stations it was only 1·3. This shows that tuberculin statistics based upon hospital experience alone should not be accepted as applicable to the general child population. The rate of positive reactions was higher in Manhattan than in Bronx, which is in agreement with the conclusions of the Framingham investigators that the incidence of tuberculous infection is highest in poor districts. The next step was to ascertain the after-history of 460 hospital infants who had yielded positive tuberculin tests, and the cases were divided into the following groups :—

I.—Infants suffering from advanced tuberculosis (pulmonary, miliary, or meningeal), 112 cases. Of these, 96 per cent. died soon after admission to hospital.

II.—Infants suffering from tuberculosis of bones and joints or glands, 32 cases. Of these, 32 per cent. were found to be dead, of whom just over half were stated to have died from tuberculosis.

III.—These had yielded positive skin tests but no clinical evidence of disease, 316 cases. Skiagrams suggested enlargement of tracheo-bronchial glands in 61 cases. Of these, 6·5 per cent. had died of tuberculosis, 14·5 per cent. from other causes. Of the remainder (207), 39 per cent. had died but death was attributed to tuberculosis in only 3·7 per cent.

The conclusion drawn from these figures is that resistance to tuberculous infection in infants is higher than is generally supposed, a poor resistance to tuberculous disease being contrasted with a vigorous resistance to infection. Histories of exposure to infection are, of course, often unreliable, and attention is drawn to an investigation made by the New York Tuberculosis and Health Association in 1925, when it was found that the hospital records of 135 cases of tuberculous meningitis stated that there had been exposure to infection in only 19 per cent. of the total. More careful inquiries proved that 56 per cent. of the children had been contacts of sufferers from tuberculosis, which indicates how misleading perfunctory questions may be. Miss Asserson rightly insists that exposure to infection should mean contact with persons who are suffering from " open " tuberculosis, and that the type and length of such exposure should be noted. Comparison of contact and non-contact cases proves that the mortality from tuberculosis is exceedingly high among infants exposed to family contact with the disease. Infants not so exposed, who receive infection in a more casual or incidental way from outside sources, develop a surprising degree of resistance. This contradicts the opinion of those who maintain that since infection is inevitable its source is a matter of small moment, and that the privilege of motherhood should not be denied to a woman because she suffers from active phthisis. In this connexion it may be noted that of 40 infants who remained in contact with phthisical mothers 65 per cent. died of tuberculosis, while of 37 infants " boarded out " only one died of the disease though all had been infected. The highest death-rates were recorded among those who had been exposed to infection at earliest ages. Miss Asserson concludes that " Such unnecessary waste of infant life, as is shown in the deaths of the 120 infants in this study who died of tuberculosis, the majority because they were continuously exposed to the disease, must make us pause to consider whether or not we are facing and assuming a responsibility which rests upon us to protect the most susceptible of human beings from this preventable disease." The question is equally pertinent on the two sides of the Atlantic.

[1] Amer. Rev. of Tuberc., 1927, xvi., No. 4.

FASTING BLOOD DONORS.

IT has long been recognised that the reactions which may occur after blood transfusions can be differentiated into those caused by the group peculiarities of incompatible bloods and those due to some other undetermined cause. The former are sometimes very serious, but fortunately rare ; the latter are relatively common in some operators' experience, but are hardly ever serious, even if distressing to the patients. Many different causes have been assigned for the lesser reactions—e.g., sodium citrate, cooling of the blood, use of rubber tubing, destruction of leucocytes—but none has seemed to be conclusive, and the hunt has continued. A new hare has lately been roused by Drs. Brem, Zeiler, and Hammack,[1] at Los Angeles, which may reward pursuit. These observers had occasion to administer nine transfusions over a period of six years to a patient who suffered from a bleeding duodenal ulcer. After some of the transfusions he had somewhat severe reactions, after others he had none. An attempt to discover the reason for the different results revealed the fact that a reaction appeared to follow the use of a recently fed donor, but that it was absent if he had fasted. The suggestion is therefore made that the reactions may be due to the toxic effect of products of digestion in the donors' blood, and that a donor should avoid all protein food for some hours before giving his blood for transfusion. The suggestion is obviously still in the realm of speculation, the number of observations so far made being very small.

[1] Amer. Jour. Med. Sci., 1928, clxxv., 96.

NURSES IN MISFORTUNE.

TO make provision for old age, to prepare a few defences against misfortune—these are wise precautions for all who earn their living. Nowadays this is so generally recognised that many forms of employment carry an obligation to subscribe to pension and insurance funds, and a feeling has arisen in consequence that only the improvident can find themselves in destitution. But the solicitude of employers and facilities for self-protection have not always been what they are to-day, and in certain walks of life there are survivors from another epoch whose unhappy condition, made worse by the war, demands generous assistance. In considering the hard lot of the women to whom attention is directed by the Nurses' Fund for Nurses, it will be remembered that those who entered the nursing profession 30, 40, and 50 years ago were little encouraged by the hope of a comfortable life or adequate remuneration. Most of them must have begun their work from a desire for useful service, and some of those who have most conspicuously failed to help themselves have done so because their heart was in helping others. For this reason we have watched with sympathy the scheme of relief started by Miss S. Bulan and carried on under

difficulties during the past two years. The *Nursing Times*, of which she was until lately the editor, has recorded week by week an admirable attempt to find the most unfortunate members of the nursing profession and give them whatever help was possible. Though money is not always their only, or indeed their chief, need, this work has involved a good deal of expenditure, and since the fund established a home in Clapham where aged nurses may live without anxiety for the future, its financial responsibilities have been heavy. The original intention was to ask subscriptions only from members of the nursing profession, and the £3127 so far collected has largely come in small sums from that source. But there is so much more to do, and so real a need for money that the fund's promoters would be grateful for help from other quarters. Patients sometimes ask how they may express thanks for careful nursing, and this appeal suggests a way which may commend itself. Some of our readers, too, may themselves be under an obligation which they would like to recognise by contributing to the fund. Condescension, begging, over-organisation, and the other incidentals so often associated with giving money are none of them in question here; for it will be long before the community ceases to be in debt to the nurses—especially, perhaps, those of the last generation—and anyone who sends a subscription to the hon. secretary of the fund (c/o the *Nursing Times*, St. Martin's-street, London, W.C. 2) may rest assured that it will be used with understanding.

The Services.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Sub-Lt. E. C. W. Maxwell to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

Capts. C. A. Slaughter (Prov.), H. A. Boyle, and T. E. B. Beatty (Prov.) to be Majs.

Temp. Capt. J. R. P. Allin relinquishes his commn., and is granted the rank of Maj.

Lt. A. E. Campbell to be Capt.

Temp. Lt. J. W. Kendall to be Lt. on prob., and relinquishes the Temp. rank of Lt.

Lt. (on prob.) J. H. Anderson, from the secd. list, is restd. to the estabt.

ARMY RESERVE OF OFFICERS.

R. W. Agnew to be Lt.

SUPPLEMENTARY RESERVE OF OFFICERS.

A. Roberts to be Lt.

TERRITORIAL ARMY.

Maj. C. Douglas, T.D., having attained the age-limit, is retd., and retains his rank with permission to wear the prescribed uniform.

Capt. D. C. Bowie, R.A.M.C., to be Divl. Adjt. 54th (E. Anglian) Div., vice Maj. E. Phillips.

ROYAL AIR FORCE.

Flight Lt. H. Penman is granted a permanent commn. in this rank.

INDIAN MEDICAL SERVICE.

Temp. Lt. Devendra Nath Chakravarti to be Temp. Capt.

Temp. Capt. C. L. D. Roberts, whose relinquishment of temp. commn. has been notified, is granted the rank of Capt.

Capts. Shridhar Atmaram Phatak and R. A. Warters to be Majs.

Col. R. W. Knox retires.

DEATHS IN THE SERVICES.

Sir ROBERT PORTER, K.C.B., C.M.G., Director of Medical Services of the Second Army in France, who was taken ill with a commencing attack of pneumonia while awaiting the arrival of the coffin of his old comrade Earl Haig, at Westminster Abbey, died at his residence in Beckenham on Feb. 26th in his seventy-first year.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCLXV.

TREATMENT OF DISTURBANCES INCIDENTAL TO EARLY MENSTRUAL LIFE.

IT is of considerable importance to a girl that her guardians and medical adviser should realise that the menstrual function, from its onset, should be free from any disturbance of a pathological nature.

I will not refer to the physiological changes which take place at puberty, except to those which are sometimes treated as though they were abnormalities. The pathological disturbances may be considered under the following headings: Primary Amenorrhœa, Secondary Amenorrhœa, Dysmenorrhœa, Menorrhagia, Neurotic Disturbances.

Primary Amenorrhœa.

It is sometimes difficult to decide if a case is one of primary amenorrhœa or of delayed development. If a girl has not begun to menstruate by her sixteenth birthday it is usual for the mother to seek advice. This delay in the onset need not in itself cause anxiety. In my experience the age of onset has varied between 8 and 19 years, and in both extremes normal womanhood has supervened. In all cases, however late the development, some growth, both in height and weight, has occurred for at least a year after the first menstrual period. This fact may be helpful in prognosis.

Before one is justified in reassuring the mother with regard to a girl over 16, in whom the menses have not appeared, the following particulars should be ascertained: 1. That the health is good. 2. That the secondary sexual characteristics have developed. 3. That growth is continuing, and that there is no sudden fall in the *rate* of growth, especially with regard to weight. 4. That there is no abnormality found on medical examination. This should include inspection of the hymen and a pelvic examination per rectum, by which any gross abnormality of the genital organs may be excluded. It must be remembered that atresia of any part of the genital canal may be the cause of apparent amenorrhœa.

If all these conditions are satisfactory it is important that both mother and daughter should have their minds set at rest, and be told that no treatment is necessary. If, on the other hand, the girl is in good health, but growth appears to have stopped, or to be definitely diminishing in rate, a more serious view must be taken, and an attempt should be made to stimulate development of the generative organs by endocrine therapy. Treatment by small doses of thyroid substance (with or without anterior pituitary) or by multiglandular tablets, is sometimes followed shortly by further growth and the onset of the menses. But it seems impossible to know if, in these rare cases, the course of nature has been affected by such therapeutic measures, especially as it is not so very uncommon for growth to stop for a time and then to recommence without any medical interference. In cases where secondary sexual characteristics have not developed before growth has ceased I have seen no sign of development of the sexual organs after prolonged treatment.

Secondary Amenorrhœa.

In addition to the minor irregularities of periodicity so common during early menstruation I have noticed three types of secondary amenorrhœa in young girls.

Type 1, in which amenorrhœa, lasting six months or more, sets in after the first few periods. This is of frequent occurrence in children who begin to menstruate early—at the ages of 10, 11, or 12—and must be of developmental origin.

Type 2, in which amenorrhœa, lasting for three to nine months, occurs in girls in whom regular menstruation has been established for some years. This

phenomenon is common in those who have experienced some change in environment. The same thing may occur after a shock or an operation on any part of the body, and is probably due to an upset of the endocrine balance due to emotional disturbances.

Neither of these two types of amenorrhœa is associated with anæmia or ill-health. No treatment is called for except to reassure a nervous patient.

Type 3.—The third type of amenorrhœa has a greater significance. It occurs too late to be of developmental origin and is not associated with change of environment. In young women of 17 or over in whom pregnancy, anæmia, tuberculosis, or other specific disease, both local and general, can be excluded, the onset of amenorrhœa, especially if it is associated with insomnia or other symptoms of neurosis, cannot but give cause for anxiety, since the condition is not infrequently linked with a morbid psychology and may even be a forerunner of insanity. These are cases in which glandular treatment may have a definitely beneficial effect. The administration of thyroid substance (a quarter or half a grain daily) and of small doses of multiglandular preparations has been followed by the recurrence of regular periods and an increase in the general welfare of the patient. But relapses may occur if the treatment is discontinued and administration of the remedies must go on for an indefinite period.

Dysmenorrhœa.

This term is here used to mean any suffering definitely associated with the menstrual period. Treatment in the first place should be prophylactic and the measures I would advocate are: (1) That all girls be taught that menstruation is a natural function and should not involve any pain or disability, and that no change need be made during the period in their ordinary habits with regard to baths and exercise or brain-work. (2) That school authorities be urged to rescind rules restricting the natural activities of children during menstruation, and that cycling, gymnastics, and games, such as hockey be allowed. (3) That employers of young women engaged in sedentary and standing occupations be urged to provide opportunity for daily exercise, such as drilling, the exercise to be continued throughout the period. This has proved to be of mutual advantage to employer and employed in factories.

When dysmenorrhœa has become established the treatment I adopt, after assuring the patient that her suffering is unnecessary, has a two-fold object: (*a*) To stimulate the circulation of the blood in order to relieve the hyperæmic uterus. The quickest means of doing this is a hot bath; the more lasting measure is vigorous exercise. (*b*) To direct the patient's attention from herself by providing interesting occupation. Hence games or active work are preferable to set exercises.

The most beneficial exercises are those involved in: picking up objects from the floor and placing them on a shelf above the head; kneeling and swinging the hands round alternately as if polishing the floor; squatting on the floor and bending to and fro, as in rowing; and standing and doing swinging movements, as in driving a golf-ball. All these movements can be executed in a small bedroom and if they are practised for 10 to 15 minutes daily for a week before the onset, and continued throughout the period, the pains will not develop or will be so slight as to be negligible. In severe cases the exercises may have to be repeated during the day. After three months they can generally be relaxed with impunity. For nervous patients it is useful to prescribe a sedative, such as tab. acetanilid co. (B.P.), to be taken thrice daily on the day preceding and for the first two days of the period. In no case do I consider that the operation of dilatation, with or without curetting, is justifiable treatment for dysmenorrhœa in a young girl whose generative organs are healthy.

Menorrhagia.

Uterine hæmorrhage, severe enough to be called menorrhagia, is rare in young girls. The flow is sometimes rather excessive for a few periods, and, until the normal loss is established, outdoor games and sports during the period must necessarily be restricted; but they should be replaced by exercises at home suited to the severity of the condition. The exercise in the kneeling position is useful for this. In cases of true menorrhagia, where the periods, previously normal, have become persistently prolonged and the flow excessive, the cause in young girls is generally a toxæmia. A septic focus should be looked for and can often be found in adenoids, tonsils, or teeth, or in a chronically infected appendix. Severe constipation may be the sole cause of the trouble even when regular evacuations are reported.

Neurotic Disturbances.

The occurrence of irritability, increased emotionalism, depression, and other symptoms of nervous instability during the menstrual period has, I think, been over-estimated. These symptoms are certainly rare among girls who are expected by their elders to remain well during the period, and are often only detected by those who expect to find them. It is found that teachers who have not been informed are not, except in rare instances, able to detect when their pupils are menstruating. Nevertheless this type of neurosis certainly exists, and the victims can generally be cured by what might be called "verbal treatment." I have usually found it successful, and there is no doubt that in many the nervous disturbance has in the first place been induced by suggestion. Who would not be depressed on being told, at the age of 13, that, in future, she would be an invalid for three days every month? Prevention is therefore in most cases dependent on a sensible upbringing. When there is pain or discomfort the presence of neurotic symptoms is not surprising and the treatment for both conditions is the same—namely, employment in some interesting active work or game. It is for the purpose of discouraging introspection, which leads to these neurotic states, that I advocate outdoor games or active work rather than set exercises as a cure for menstrual disorders.

ALICE E. SANDERSON CLOW, B.Sc., B.S., M.D. Lond.
Cheltenham.

DONATIONS AND BEQUESTS.—Among other bequests Mr. Francis Stanley Holland, of Hove, Sussex, and Eastcheap, London, left £1000 to the Royal Sussex County Hospital.—Mr. Walter Skaife, of Southend-on-Sea, who left £35,707, on his wife's death, after certain legacies, left the ultimate residue of his property equally between St. Bartholomew's Hospital, Dr. Barnardo's Homes, the London Hospital, and the Victoria Hospital, Southend-on-Sea.—The Liverpool University Students' "Panto Day," after the deduction of £100 for expenses, yielded £5000 for the city hospitals.—The late Mr. Edwin Pope, of Dorchester Brewery, has bequeathed £5000 to the Dorset County Hospital.—The late Mrs. Clarissa Ellen Slyman, of Thorncliffe, Urmston-lane, Stretford, Lancs, left among other bequests £1000 each to St. Mary's Hospital, Manchester, and St. Dunstan's Blinded Soldiers' and Sailors' Hostel; £350 each to the Royal Infirmary, Manchester, and Dr. Barnardo's Homes; and £250 to the Liverpool, the Devonshire Hospital, and Buxton Charity, Buxton.—Mrs. Mary Jane Bradley, of Lyndhurst, Huby, Weeton, Harewood, Yorks, left by her will £1000 to the Leeds General Infirmary in addition to bequests to other charities.—Mrs. Adelaide Florence Henderson, of Rosebank House, Wick, left £15,000 and her residence Rosebank and ground therewith to the Wick and Pulteney District Nursing Association, to establish, equip and partially endow a nursing home in Wick in memory of her sisters and herself, to be known as "The Henderson Memorial Nursing Home," the interest of £2000 towards the running expenses of the ambulance car she lately presented to the County Council, £500 each to the Nicholson-Mackenzie Hospital, Strathpeffer, and the Bignold Cottage Hospital, Wick, and part of the residue of the estate to the Sick Children's Hospital, Edinburgh.—Mr. Alfred Ernest Briggs, of Low Moor, Bradford, Yorks, left £500 to the Bradford Royal Infirmary and the ultimate residue of his estate in trust for the erection of almshouses for the poor of Low Moor.—Mrs. Laetitia Elizabeth Beeston, of Clevedale, Winchester, left £1000 to the Royal Hants County Hospital and £1000 in trust.

Special Articles.

A COMPARISON OF COMPULSORY SICKNESS ASSURANCE IN VARIOUS COUNTRIES.

THIS volume [1] is the outcome of the decision of the International Labour Conference in 1925 to collect and publish information on the progress and working of social insurance. It presents the results of a systematic examination, based on facts obtained from 24 countries, of the essential aspects of compulsory sickness insurance considered under the following headings: scope; benefits; financial resources and their management; institutions and supervisory authorities; disputes, judicial authorities, offences and penalties; the situation of foreign workers. The labour involved in the preparation of the book must have been enormous, for it has been necessary "to summarise 350 laws and regulations, 220 reports of various kinds (representing tens of thousands of pages of legal or technical works, and thousands of statistical tables) written in some 15 languages." The result is an octavo volume of nearly 800 pages presenting a systematic review, unique in its range and authority, of the present position of compulsory sickness insurance throughout the world. Though packed with facts and figures, the matter is so methodically and conveniently arranged that the inquirer can readily pick out any particular kind of information he may require. To those interested in the promotion of the public health it is an invaluable document.

Compulsory insurance against sickness is a comparatively recent addition to the measures taken by the modern State to promote the health of its members. It began in Germany in 1883, and was first applied only to certain industrial groups, to which large additions were made in 1885 and 1886. The example of Germany was followed by Austria in 1888 and Hungary in 1891, but it was not until the twentieth century that any considerable extension took place. Since the war progress has been rapid. The movement has spread beyond Europe; Japan adopted compulsory insurance in 1922 and Chili in 1924, and it is probable that other countries will follow in the next few years. As might be expected, there are wide variations in the insurance schemes in operation in the different countries in regard to the classes of persons insured, the methods of administration, and the character and extent of the benefits. For instance, the proportion of insured persons varies from 3 to 35 per cent. of the total population, and from 15 to 86 per cent. of the employed population. The scheme may apply only to workers in certain specified callings—e.g., to miners or seamen, or to those employed in undertakings of a certain size or exposed to exceptional risk of disablement. In some countries agricultural workers or domestic servants are excluded. There are similar variations in the methods of working the various schemes and in the benefits conferred by them.

Modern Tendencies of Sickness Insurance.

But when the schemes are considered as a whole certain broad lines of tendency emerge, and it is because of the material it offers for the examination of these tendencies that the present volume is chiefly of value to the student of social conditions. It would seem that compulsory sickness insurance once established tends generally to develop on certain lines. Occupations at first excluded from the scheme tend later to be included in it. In the last 15 years no less than ten countries have brought agricultural workers within the scope of compulsory insurance, and the exclusion of domestic servants and temporary workers has in most countries been removed. In short, compulsory sickness insurance tends to cover the whole class of wage-earners, including non-manual workers of small means. On the other hand, voluntary insurance shows no tendency to extend. Many compulsory schemes have a voluntary side, but with rare exceptions it has attracted very few entrants. In Great Britain the number of voluntary contributors was insignificant before the Widows', Orphans,' and Old-Age Contributory Pensions Act offered additional and substantial advantages to the insured population.

It is, however, in the development of the benefits given by the various schemes that the most interesting tendencies of modern sickness insurance emerge. In determining the nature of the benefits two policies may be adopted. One is to grant the disabled insured person a benefit in cash, so that he may purchase what he thinks he requires, within the limits of the sum available. The other is for the insurance institutions to shoulder the responsibility of providing him with what is essential to restore his power to support himself. In most countries both kinds of provision are made, but there is a strong tendency to develop the second policy and make benefits in kind more important than benefits in cash. In the early days the chief object was to secure for the disabled worker certain payments in place of the wages that sickness prevented him from earning. The insurance contributions were regarded as something in the nature of savings deposited for the purpose of being drawn out on the arrival of a "rainy day." But this savings bank notion has developed into a much broader conception of insurance benefits and insurance purposes. Merely to provide the sick worker with money to enable him to tide over a period of enforced incapacity is now generally regarded as an insurance function of minor importance. The modern aim is to effect a complete and rapid restoration of working capacity and to provide whatever may be reasonably necessary to attain this aim.

Medical Services.

From this point of view the provision of medical care is obviously essential, and it is important that the doctor should be available at the earliest possible stage, when the prospect of care is most promising. There are very few schemes of sickness insurance that do not provide medical treatment, and in nearly all countries it is available upon entry into insurance without a waiting period such as is required before cash benefits can be paid. There are variations in the range and nature of the medical provision made, but the general practitioner is the foundation upon which all the systems of medical services rest. He is everywhere the first and most essential element. But specialist services are also widely provided. In some countries—e.g., Germany, Austria, Czecho-Slovakia, Hungary, and Poland—the insurance institutions are under obligation to provide specialist treatment, while in most other countries such provision is optional, and the option has been widely exercised. Dental treatment forms part of the benefits given by most of the insurance schemes, especially where the preventive value of dental services is most clearly appreciated. Hospital treatment, including maintenance, though usually an optional benefit, is very widely provided, and the cost of removal is borne by the insurance funds and forms part of the benefit. Home nursing is a form of special assistance provided in five countries.

Family Provision.

Maternity benefit is an element of increasing importance in social insurance. In a few countries, as in Great Britain, it takes the form of a cash payment only, but usually assistance in kind is also provided, including the services of midwives, and, if necessary, medical attendance together with any medicine required. Admission to a maternity home may be secured, and in many countries the insurance institutions give to mothers who nurse their babies a "nursing bonus"—i.e., a weekly allowance payable,

[1] Compulsory Sickness Insurance. Comparative Analysis of National Laws and Statistics. International Labour Office Studies and Reports. Series M (Social Insurance), No. 6. Published in the United Kingdom for the International Labour Office (League of Nations) by P. S. King and Son. 1927. Pp. 794. 12s.

usually, for 12 weeks after the confinement. Maternity benefit is far from being restricted to insured women; in 14 countries it is given to the wives of insured men in virtue of the husband's insurance, while in five countries the benefit is extended to other members of the insured person's family—namely, daughters, grand-daughters, and sisters if they are dependent on the insured person and are members of his household. This extension is compulsory in Austria, Germany, and Poland, and optional in Czecho-Slovakia and Roumania.

The provision of maternity benefits for the wives and other dependent members of the insured person's household introduced into social insurance an element of special significance. It gave expression to the conception that the real unit for insurance purposes is not the individual worker, but the worker together with his family, and that no insurance system can be regarded as complete that does not provide for the medical care of the insured person's dependents. This conception of the function of sickness insurance has made rapid headway since the war, and in most countries the provision of medical treatment for the dependents of the insured is either a compulsory or an optional benefit. Usually the dependents receive the same range of medical services as the insured persons, but in certain countries such special forms of provision as spa treatment or treatment and maintenance in convalescent homes are reserved exclusively for the insured.

The social importance of this development is obviously considerable and likely to have far-reaching results. By making medical care freely available for the children the influence of sickness insurance in the field of prevention has been greatly extended. The doctor can be called in early, infection detected in an early stage and brought under timely control, serious disease can be attacked in its beginnings when the prospects of success are most promising, and skilled advice can at all times be secured during those critical early years of life which have so important an influence on the health of the worker when he reaches the period of productive activity. The preventive aspect of family provision is fully realised by those responsible for the administration of insurance schemes on the continent, in which preventive work tends to take an increasingly important place. It is, in fact, the latest and perhaps the most significant development of sickness insurance. In various countries recent legislation has given the sickness funds wide powers to take preventive action, and many are making extensive use of these powers. Health instruction is given by means of lectures, health exhibitions, &c., and through the medium of the press and the cinematograph; antenatal consultations have been established, holiday camps for children organised, and in various ways the funds participate in the fight against tuberculosis and venereal disease and for the protection of child life.

The Organisation of Medical Services.

The book contains a chapter on the organisation of medical services which is of special interest to medical readers. In nearly all the countries in which compulsory sickness insurance has been established the institutions responsible for the payment of cash benefits are responsible also for the provision of medical services, although not infrequently this duty is carried out not by the individual institutions but by their federations. The most important exception is to be found in the British system, in which the arrangements for medical treatment are made, not by the approved societies, but by the insurance committees. In Esthonia and Latvia the employers are responsible for medical provision, while in Russia this responsibility devolves upon the public health authorities. On the continent the conditions under which medical practitioners undertake service vary considerably, not only among the various countries, but also within the same country, and there are similar variations in regard to the right of the insured person to choose his doctor. There appears to be a growing tendency for the insurance institutions to provide themselves with an elaborate medical equipment. The Berlin Federation of Sickness Funds has established 40 clinics, each being responsible for the treatment of the insured persons and their families living in a certain area. In Poland the sickness funds had by the end of 1924 no less than 312 clinics, 116 pharmacies, 55 hospitals, and 7 sanatoriums. Similar provision on an increasing scale is being made in Czecho-Slovakia. This subject might with advantage to the medical reader have been treated in fuller detail and with a critical discussion of the principles involved and the difficulties encountered, so that an unwary reader might not carry away an impression of a harmonious adjustment of varying interests which a closer acquaintance with local conditions might possibly modify.

It is impossible, however, to make even a cursory study of this book without being profoundly impressed by the magnitude of the social movement it describes. Compulsory sickness insurance has created a vast network of organisations endowed with wide powers and disposing of large funds. How to direct these immense new forces to the best advantage is one of the most important public health questions of the present day.

THE THIRD RACE BETTERMENT CONFERENCE.

FROM Jan. 2nd to 6th there took place at Battle Creek, Michigan, U.S.A., the Third Race Betterment Conference. The official purpose of these conferences is—

"to bring together a group of leading scientists, educators, and others for the purpose of discussing ways and means of applying science to human living in the same thoroughgoing way that it is now applied to industry—in the promotion of longer life, increased efficiency and well-being, and of race improvement."

As many as 60 addresses were delivered in the course of these four days by different speakers. The subject matter of the conference, as dealt with in these addresses, roughly falls into the following divisions: eugenics and heredity; public health, immigration, and longevity; nutrition; and a miscellaneous division comprising such heterogeneous topics as athletics for women, newer values in education, the therapeutic value of sunlight, the future of the Red Indians, the cultural value of advertisements, and the bearing of the conditioned reflex upon no less a subject than "moral hygiene." Only the salient points arising from these addresses can be dealt with here.

Eugenics and Heredity.

In the direction of "negative" or restrictive eugenics, an address was given by Dr. Paul Popenoe dealing with sterilisation in California. Up till January, 1927, 5000 sterilising operations have been performed in this State, 4000 of them in the State hospitals for the insane, and 1000 in the State home for the feeble-minded. There have been four deaths in the course of these operations—a man and a woman from ether anæsthetics, and two women from peritonitis. Apart from these official State-controlled operations, it is estimated that some 2000 women have been voluntarily sterilised in private practice. In Michigan, wherein there exist a minimum of 73,000 feeble-minded, sterilisation has been performed in 111 cases. Of this procedure, Dr. H. E. Randall said that no one expected, by it, completely to eliminate mental defect from the community since the condition was frequently "carried," in the genetic sense, by normal persons. Yet it was reasonable to hope that, by the process of sterilisation, the contamination of the general population with the taint of latent mental defect would, in course of time, be diminished. The reports upon patients operated on in Michigan do not bear out the contention that the measure promotes loose moral conduct and spreads venereal disease. Dr. Randall also says: "We have seen no improvement, as Steinach reports, in the direction of rejuvenating old men. Our own impression is that none have been made worse. All have recovered promptly and the operation has led to a cleaner moral life of the paroled."

Much evidence was advanced of the supposedly harmful influence on the national stock of differential fertility. Thus an investigation by Prof. Alsworth Ross revealed

"that the average number of children born into 100 dependent families of American stock was 2½ times the number born from 2200 families of the same stock who had a son, a daughter, a nephew or a niece in college." Prof. E. M. East also dwelt upon the dysgenic tendency of America's increase of population. He is of the opinion that this tendency can best be checked by "spreading a clearer genetic point of view among our physicians." Dr. E. J. Hickson, director of the Psychopathic Institute, Chicago, laid stress on the very close relation between the defective and criminal classes in his city, each of which classes amounts to some 2 per cent. of the population. But this 2 per cent. absorbs 35 per cent. of the gross taxes in addition to being a source of considerable anxiety to the remaining 98 per cent. Dr. Hickson's wide experience of this class of criminal defective has led him to advocate depriving it of political power by a system of proportional voting. In connexion with the relative influences of heredity and environment in the creation of criminal and defective types, there was some difference of view. Dr. Riddle, of the Carnegie Institute, advanced a plea for the foundation of another institute for the study of the influence exerted by environmental conditions upon hereditary characteristics. But Dr. Henry F. Vaughan, Commissioner of Health for Michigan, so doubted the value of improved "nurture" that he advocated sterilising burglars. He further urged that "those who show themselves, during school life, to be low-grade morons, should be desexed (i.e., presumably, sterilised) before the reproductive age."

Public Health, Immigration, Vital Statistics, and Longevity.

Dr. Alexis Carrel described his experiments on the immortality of tissues and argued that further progress in knowledge of cell physiology and of the chemistry of nutrition would lead to a prolongation of human life. A plea for periodic medical examinations of healthy people was made by Dr. Franklin H. Martin. He suggested that these examinations be made in the "standardised" hospitals of the United States, of which there are now some 1800. "Each hospital," he proposed, "volunteering to establish such facilities will be accredited as conducting a health inventorium." This scheme is being given careful consideration by the American College of Surgeons, of which Dr. Martin is Director-General. In a lecture upon a similar subject, Dr. Guy L. Kiefer said that certain life insurance companies were instituting regular medical examinations of its policyholders, the consequent lengthening of whose lives resulted in increased profits for the companies. And "a recent legislation Act in Michigan requires the physical examination of persons driving motor vehicles carrying passengers for hire. This brings another large group of persons into the ever-increasing orbit of periodic health examinations." Similar views were expressed by Dr. Eugene Fisk and Dr. James Glover. Proposals favouring the "positive" aspect of eugenics—implied in encouraging the fertility of the well-endowed—were limited to suggestions with regard to immigration. Upon this subject, again, there was division of opinion. Prof. East suggested that stricter medical examinations should be instituted in the "emigrating" countries of Europe with a view to excluding more effectively than is now done physically inadequate or defective types. Dr. Harry E. Hull, Commissioner-General of Immigration, held that Americans should encourage the immigration of "those Nordic strains of Northern Europe which in culture and rich heritage of tradition, contributed the most desirable material to our national structure." But Prof. Ales Hrdlicka expressed his disapproval of this partiality for Nordic strains in the following words: "In the last 15 years have been heard many alarms of the threatening deterioration of American stocks through the influx of the so-called 'inferior races' of white derivation. These threats have received no scientific foundation."

Nutrition.

A considerable amount of attention was accorded to this subject during the conference. By Dr. Arthur I. Kendall, dean of biology, Northwestern Medical School, it was argued that by the elaborate culinary preparation of foods were destroyed many strains of comparatively unresistant lactic acid-forming organisms which, in the human alimentary tract, oppose the multiplication of maleficent spore-forming organisms. Many resistant and pathogenic bacteria of this group were capable, as sole occupants of the alimentary tract, of seriously disturbing the normal "man-microbe balance." Several speakers stressed the plea, now reverberating through this country, for the consumption of more milk, wholemeal bread, fresh fruits, and green vegetables. Dr. Adolphus Knopf attributed the relatively high incidence of pulmonary tuberculosis among young women between the ages of 15 and 30 years to self-imposed habits of underclothing and under-nourishment which are inspired by a feminine fashion favouring a boyish appearance and figure. And Prof. Louis Howburgh warned his hearers against partaking of diets too rich in proteins. Diets, he said, containing 10 per cent. of tryptophane and cystine, were capable, in one week, of killing rats, in which were found, at post-mortem, extensive hepatic lesions.

Popular Science.

Numerous miscellaneous addresses were delivered. Of these one deserves notice as illustrating a defect which inevitably creeps into popular semi-scientific conferences. The organisers of these conferences naturally strive to secure the support of eminent scientific men. Now the value to science of a given piece of research is by no means commensurate with its capacity to yield generalisations of popular interest. Having consented to make a contribution to the conference out of sympathy with its general aims, the scientific worker finds himself placed between the Scylla of delivering an address totally unintelligible to the bulk of his audience, and the Charybdis of having to distil from his theme, by some means or other, an argument relevant to existing social conditions. That this process of distillation may at times be somewhat forced was indicated, at this conference, by an address from Dr. W. N. Boldyreff upon "Some New Physiological Data as a Basis for Moral Hygiene." From the fact that "all vital phenomena should be classed under one of two groups—(1) useful or pleasant process, and (2) harmful or unpleasant processes," Dr. Boldyreff deduces the conclusion that "*temperance* should be the basis of our behaviour." Thus, at semi-scientific conferences with social aims, are "physiological data" stretched upon the Procrustean bed of popular demand.

SOUTH AFRICA.

(FROM OUR OWN CORRESPONDENT.)

Medical Practice by the Qualified and Unqualified.

AFTER being before the House of Assembly for 11 years with various alterations and amendments, the Medical, Dental and Pharmacy Bill has at last passed its third reading and been transmitted to the Senate, so that there is every prospect of it being placed on the Statute Book this year. Last year Dr. Malan, Minister of the Interior, by sheer perseverance advanced the Bill as far as the committee stage before the House adjourned, and had disposed of 75 of its 97 clauses. Among those first 75 clauses were the most contentious, including those dealing with the faith-healers, chiropractors, dental mechanics, &c., who flourish exceedingly in this country. A number of Members from the Platteland had nobly espoused their cause for many years, but at last these Members seem to have realised the futility of their arguments.

When the Bill was resumed in the committee stage last week Dr. Malan moved a new clause obviously designed to placate the Platteland. This was to the effect that—

1. No person registered under this Act shall himself make or attempt to make or to recover, or shall enter into any agreement or associate himself in any way with any other person for the purpose of making or fixing excessive or extortionate charges for any services rendered or for any article supplied or to be supplied by him by virtue of being so registered.

2. Unless the circumstances are such as to render it impossible so to do, every person registered under the Act shall, before rendering any service by virtue of being so registered, inform the person to whom the service is to be rendered, or the person in charge of such person, of the fee which he intends to charge therefor (*a*) when so requested by any person concerned; or (*b*) when such fee exceeds that usually charged for the service.

3. Any registered person who contravenes or fails to comply with any provision of this section shall be guilty of improper or disgraceful conduct within the meaning of Chapter iv. of this Act, and it shall be the duty of the Council or the Board to take cognisance of and deal with such conduct under that Chapter.

Dr. Malan declared that the object of the Bill was not merely to place registered persons in a privileged

position; its object was also, and principally so, to protect the public, and for that reason the amendment proposed aimed at preventing registered persons from charging exorbitant fees. The Medical Association and prominent doctors had asked that the second provision, quoted above, should be inserted in the Bill. Several Members of the Opposition, however, considered that it was a slight on the medical profession, and a mere sop to the country Members, whose complaint last year was that the farmers are being robbed by the doctors. Others maintained that, although the standard of the medical profession in South Africa is admittedly high, there are exceptions, and that the provision is really intended to meet the case of those exceptional doctors who charge extortionate fees. It was asked, "Who was to determine when a fee exceeded the fee usually charged?" and the Minister replied that anybody who complained that the charges in any particular case were extortionate could go to the court, and the court would return a finding based on the usual charges in such cases, as ascertained from the evidence of professional men of standing. It would be easier, however, if the Medical Council as provided for in the amendment were put in a position to take cognisance of charges generally. The amendment was carried by 58 votes to 31.

Another controversial point was a new clause requiring that in any case in which a patient dies after the administration of chloroform, the magistrate of the district should hold an inquiry. It is difficult to see the necessity for the clause, because under common law there must be an inquest in all such cases. However, the clause was adopted, Dr. Malan observing that although it was not perhaps necessary, it would do no harm.

A question was raised concerning native men and women herbalists in Zululand who had been licensed for many years, and it was urged that the native population ought not to be deprived of such treatment, because often they had nothing else and could not afford to pay for anything else. Dr. Malan remarked that 2000 of these herbalists had been registered in Natal, or more than all the white doctors in the country; yet there were none registered in the Transkei, which seemed to manage very well without registration. He agreed that apart from such native practitioners the natives had nothing. The Government had, however, appointed a Commission to go into the whole question of medical facilities for natives, and he hoped something would come of it.

The final hurdle to be cleared was an amendment on behalf of dental mechanics, moving that nothing in the relevant clause should debar them from practices which they had legitimately carried on in the past. Dr. Malan declined to be shaken on this point, showing that the Select Committee had fully investigated the whole question and had been practically unanimous. The dental mechanic, he said, who wished to have the right to supply teeth on casts made by patients, had really been evading the law in the past, and did not deserve consideration in the present. The House adopted this view by an overwhelming majority. The Bill as amended was adopted, read a third time, and transmitted to the Senate.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Practice of Dentistry by Medical Men.

THE Dentists Bill was under consideration in the Dail last week in the Committee stage. It had undergone several changes since it was introduced a year ago. The most important of these was the omission of the clause prohibiting the practice of dentistry by medical men qualified after the passing of the Act. The Bill as it now came before the Dail provided that prohibitions of the practice of dentistry or dental surgery should not operate in the case of registered medical practitioners. Much to the surprise of the members of the Dail the Minister in charge of the Bill (Mr. McGilligan) proposed an amendment to this clause which would in effect have restored the original prohibition, though slightly modified. His amendment provided that a duly qualified medical practitioner who became qualified after the passing of the Act might practise dentistry and dental surgery to such an extent as was incidental to his practice as a medical practitioner, but not otherwise. The amendment was opposed by all the medical deputies present, and by many members in all parts of the House, and was defeated by a majority of 78 to 50. The opposition was based on several grounds. It was pointed out that there had been no case made for interfering prejudicially with the present privilege of medical men; that the question of defining what was incidental to medical practice would be a matter of much difficulty; that obstacles would thereby be placed in the way of dispensary medical officers giving necessary dental relief to the poor. Sir James Craig made a further point in suggesting that to limit the present privileges of medical practitioners in the Irish Free State would prejudice the agreement as to reciprocity in medical practice made between the British and Irish Governments. In his reply Mr. McGilligan combated this view, stating that reciprocity meant no more than that there would be no distinction between a medical man qualified in England and one qualified in Ireland. On the general question of the right of the medical man to practise dentistry, he stated definitely that it was his wish to deprive medical men of the large powers they held under the Bill in the practice of dentistry. Dental surgery had, he said, become a recognised profession, and it was time its position was made clear.

Mr. McGilligan carried another amendment dealing with the method of erasure from the register because of misconduct. Under the Bill the Dental Board should make investigations and report the result to the Medical Council, with whom would lie the decision to erase a name. The Minister's amendment removes from the clause all reference to the Medical Council, and leaves the decision as to erasure with the Dental Board. By another amendment the Minister removed from the Bill the minimum penalty (£50) for the practice of dentistry by an unqualified person, leaving the minimum to be fixed by the justice in each case.

PARIS.

(FROM OUR OWN CORRESPONDENTS.)

Results of B.C.G. Vaccination.

AN article by Prof. A. Calmette in the current issue of the *Bulletin*[1] of the International Union against Tuberculosis summarises the results obtained with the B.C.G. vaccine in protecting new-born infants against tuberculosis, from July 1st, 1924 (when the Pasteur Institute first placed the vaccine at the disposal of physicians and public health authorities), up to Dec. 1st, 1927. During this period 52,772 children in Paris and the provinces were vaccinated at birth with B.C.G. vaccine. 6219 were recorded as having tuberculous mothers or as living in tubercle-infected surroundings, and Calmette has followed up 5749 of these cases, the remainder being under the supervision of the health authorities in the Seine Inférieure, who have reported on them separately. Of the 5749 reported upon by Calmette, 3808 were vaccinated less than a year before Dec. 1st, 1927. At that date 118 deaths had been recorded amongst them, an infant mortality-rate of 3·1 per cent. The infant mortality-rate among non-vaccinated children in France is 8·5 per cent. The number of deaths presumably due to tuberculosis was 34, or 0·9 per cent., whereas the rate for non-vaccinated children exposed to tuberculous contacts varied from 24 to

[1] January, 1928. Paris: Secretariat of the Union, 2, Avenue Velasquez.

70 per cent. in France. Another 1941 children vaccinated between July 1st, 1924, and Dec. 1st, 1926, were aged between 1 and 3½ at the time of this report. Twenty-one deaths had been recorded in this age-group, of which four were presumed to be from tuberculosis. The general death-rate among them was therefore 1·2 per cent., compared with 1·6 per cent. for non-vaccinated children in the age-group 1–4, living in either healthy or infected surroundings. The tuberculosis death-rate was 0·2 per cent. On Dec. 1st, 1927, 917 of these children were between the ages of 2 and 3½. No death from tuberculosis had occurred among this group. 298 of them had been revaccinated at the end of their first year, but Calmette is doubtful whether this is really necessary. It now seems probable that immunity lasts longer than was at first thought. Observations on those children vaccinated by Weill-Hallé and Turpin in 1921 and 1922 and living in tuberculous surroundings, point to an immunity of at least five years' duration. This, Calmette considers, disposes definitely of the fear that the bacilli might recover their virulence and demonstrates the harmlessness of the vaccination with B.C.G. vaccine.

The statistics furnished by the Department of the Seine Inférieure are particularly interesting as this department has always had high infant mortality and tuberculosis death-rates. From Dec. 1st, 1924, to Dec. 1st, 1927, 1369 children were vaccinated at birth with B.C.G. There were 93 deaths under 1 year of age from general causes, of which 7 were presumably from tuberculosis. This gives an infant mortality-rate of 6·7 per cent. in the vaccinated group, compared with 13·4 for the department, and a tuberculosis death-rate of 0·5 per cent., compared with 8 per cent. for the age-group 0–1 year. 402 children specially noted as being in an infected environment were aged between 1 and 3 years on Dec. 1st, 1927. Only one death, from Pott's disease at the age of 17 months, was recorded among this group exposed to infection.

Disalbuminised Serums against Diphtheria and Tetanus.

The disalbuminised sera which the Pasteur Institute are now preparing according to Ramon's technique have some important advantages over the ordinary antitetanic and antidiphtheritic sera. These are that the quantity of the active substances injected (antitoxin) can be rendered more precise, that a large quantity of antitoxin can be injected in a very small bulk, and that there is a reduction in the frequency and intensity of serum reactions. The principle is as follows: the antitoxin is precipitated by the toxin; the precipitated element is centrifuged; the toxin and antitoxin are broken up by means of a weak acid, and finally the toxin is destroyed by subjecting the mixture to a temperature of 60° C., which leaves the antitoxin intact. The new sera have given good results from the point of view of cure, but they are particularly valuable for the prevention of diphtheria and tetanus. Experience with them affords us only matter for congratulation, since we no longer see those forms of serum sickness which so often followed injection and laid our patients low for several days.

Pre-operative Inoculation against Sepsis.

Except in cases where immediate operation is called for, surgeons in this country frequently prepare the ground, and increase the resistance of the patient by the use of vaccines. If the operation is septic, propidon is often used; it is a polyvalent stock vaccine, which has only one defect—namely, that it provokes reactions, not dangerous but somewhat violent. The same preparation may also be employed for aseptic operations, but where these involve the abdomen it is perhaps better to use autogenous vaccines made from the patient's own intestinal organisms. A drawback to these is the length of time required before immunisation is begun, and attempts are being made to prepare stock vaccines which will be equally effective in warding off sepsis due to bacterial invasion from the intestine.

The fashion of wearing short skirts, open shoes and silk stockings is responsible for the appearance of a special form of erythrocyanosis, in which large purple indurated lesions are seen around and above the ankle, being especially noticeable towards evening. This form of erythrocyanosis must be related to the acrocyanoses; it is due to neuro-vasculo-humoral disturbance, and is brought into evidence by cold. It seems to have some connexion with endocrine disorders, either hypothyroidism (Leopold Lévi) or ovarian deficiency (Maranon).

Favourable results with endocrine treatment have been noted in a case of acrocyanosis in a man whose left hand was purple and swollen, and who had violent pains in the feet, which had been frost-bitten during the war. A few injections of testicular extract caused the swelling to disappear, whilst the cyanosis diminished, and pain ended. This extract seems to have a profound effect on disturbances of a nervous origin, though it can hardly be concluded that these acrocyanoses are due to orchitic insufficiency.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Decrease of Goitre in Vienna.

Prof. Wagner-Jauregg (the latest recipient of the Nobel Prize for medicine) recently read a very interesting paper before the Vienna Medical Society on the effects of the campaign against goitre. Acting on his advice the Austrian Government issued in 1923 for public sale specially prepared salt containing 5 mg. of iodide per kilogramme of sodium chloride. The assumption was that every person consumes daily on the average 10 g. of salt, so that his daily intake of iodine would amount to 5/100 mg. It has appeared, however, that the actual intake amounts only to 3/100 mg., because less than 10 g. are taken daily. Prof. Wagner-Jauregg lays stress on the fact that prophylaxis, to be effective, must extend its action not only to the patient, but also to parents or even to their germinal cells, for in districts where goitre is endemic even the newborn are subject to it. Furthermore, prophylaxis should extend to the whole population, the Swiss method of giving iodine to school-children not being reliable, as many affected persons escape the treatment. A systematic investigation of all school-children in Austria was instituted in 1923, when the iodised salt was issued to the population. The children were classified according to whether the goitre was absent, beginning or slight, manifest or pronounced. In Vienna there were at that time 65,766 boys and 66,724 girls between 6 and 14 years of age in the public schools. In 1927 the figures were: 51,853 boys, 53,275 girls. In 1923 57 per cent. were without goitre, but in 1927 69 per cent. between the ages of 6 and 10 were free and 56·6 per cent. between the ages of 10 and 14. The manifest cases in 1923 numbered 1·6 per cent. and in 1927 0·16 per cent. in children of 6–10 years; the figures for the age-group 10–14 years were 2·5 per cent. and 0·43 per cent. respectively. This drop to a tenth of the original figure amongst the younger children, or a sixth amongst the older ones, can only be ascribed to the constant use of the iodised salt (called here Vollsalz=full-salt). In the group of commencing goitres the decrease is not so marked (from 30·9 per cent. to 27·1 per cent.).

A second remarkable fact is the drop in the number of operations performed for this condition. In 1923 1308 patients in Vienna underwent a goitre operation; in 1927 the figure had fallen to 806 cases (40 per cent. less). In the province of Lower Austria the figures were 152, against 123 (20 per cent. less). These facts show that the systematic use of "full-salt" is most beneficial in suppressing the spread of endemic goitre. There is also reason to believe that its use is apt to

change an existing swelling from a "manifest" or "pronounced" goitre to "slight" or "beginning" goitre. At present only 43 per cent. of the Viennese population are taking the medicated salt continually of their own accord, but all public institutions, hospitals, asylums, prisons, charitable institutes, and orphanages also use it, so that about 55 per cent. may be reckoned as definite "iodine eaters." Until now no convincing proof could be produced that the intake of iodine by parents renders their offspring free from goitre, but the fact that goitre is rather rare amongst the school-children of the lowest standards, who are coming to school this year, seems to point in this direction and will be thoroughly investigated.

Public Health Statistics for 1926.

In Vienna, with its population of 1,890,000 souls, there die on an average 70 persons daily, of whom eight are cremated and the remainder buried. The total in 1926 was 25,807 deaths (of which number 2991 were cremated). There were only 23,078 live births or, in other words, the loss of lives was over 2000, and in 1927 this loss increased; in the first half of the year it was 1800, and it was nearly double that of 1926 at the end of the year (full figures are not yet published). Analysis of the figures shows that the number of deaths is fairly stationary, but the number of births is constantly diminishing. 1300 persons died by suicide last year; 5277, or over 20 per cent. of the total number, succumbed to diseases of the heart and circulation; 3822 died from tuberculosis, and 3261 from neoplastic disease, while 2386 were victims of pneumonia. No fatal case of cholera, typhus, or small-pox has been seen in Vienna for three years, or in Austria for two years. The increase in the number of new growths and cardiovascular diseases is noted all over the country; they account for some 25 per cent. of all deaths, and are a source of great anxiety to the public health officers. The number of medical practitioners in Vienna in 1926 was 4375; in 1927 it had risen to 4430. Amongst them were 396 females. There are 3·5 medical men on an average per 1000 of the population or 3·8 female doctors per 10,000 Viennese women. The Krankenkassa have appointed 16 women doctors for female members who refuse to be examined by a medical man. The public ambulance (first-aid society) intervened in 26,246 cases last year, or 16 per cent. more than in the previous year. The number of attempted—or committed—suicides amounted to 1916 cases, or, in other words, every thousandth Viennese citizen tried to destroy himself last year. 311 persons suffered injuries in some kind of athletics or sport and 456 persons had to be treated owing to intoxication with alcohol, whilst 1518 accident cases and 811 persons who collapsed in the streets or elsewhere required the help of the ambulance. Out of 130,878 births in the Republic of Austria 3956 were stillbirths. In 124,160 cases qualified or trained helpers were present; the remaining 6218 births took place without doctor or midwife. The illegitimate births in the Republic amounted to 31,245, or 27 per cent.

Dr. Doppler's Method of Producing Hyperæmia in Circumscribed Regions.

Public attention, as well as the interest of medical men, has been concentrated lately upon a method devised by Dr. Doppler, first assistant to the well-known surgeon, Prof. Lorenz, which aims at producing an improved function of glandular organs by causing a profuse hyperæmia through dilatation of the afferent arteries. Dr. Doppler observed three years ago that by destroying certain branches of the sympathetic a marked hyperæmia could be obtained. He used this method in a case of gastric ulcer after partial resection of the stomach. The favourable result prompted him to use the method systematically in operations on the stomach to prevent the formation of peptic ulcer so often observed after surgical interference. He painted the appropriate arteries with a 7 per cent. aqueous solution of carbolic acid, which is sufficient to destroy the vaso-constrictors, whilst the vaso-dilators are not affected. The arteries appear permanently dilated, the organs become extremely hyperæmic, and their activity is increased. No evil results have been noted. Dr. Doppler is not prepared to say how long the effect will last. In his recent paper, read before the Vienna Medical Society, he spoke only of "reactivation of the entire organism" or certain parts of it which follows the "phenolisation" of the testicles (spermatic artery) or ovaries (art. ovarica), and did not speak of "rejuvenation." The methods of Steinach and Voronoff aim solely at increasing the function of the sexual glands. Doppler, however, recommends his method for the purpose of "reactivating" other organs also, especially the pancreas (in diabetic conditions). In a series of animal experiments in the Vienna Veterinary Physiological Institute Prof. Schwarz showed that the disturbed function of the pancreas can be permanently corrected by an increased supply of arterial blood. His method is based physiologically on the experiments of Dr. Leriche (Paris), who severed the sympathetic on the femoral artery; but there the dilators were also destroyed. More than 200 patients have now been treated by the new method, sometimes with wonderful results. Reports have been received that pyorrhœa disappears rapidly after Doppler's "phenolisation," and psychic disturbances have been beneficially influenced. If his observations and those of the clinic of Prof. Lorenz can be corroborated the ultimate results of this apparently modest addition to medical science may be incalculable.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 18TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 369 (same last week); scarlet fever, 1871; diphtheria, 1472; enteric fever, 57; pneumonia, 1602; puerperal fever, 52; puerperal pyrexia, 112; cerebro-spinal fever, 14; acute poliomyelitis, 8; acute polio-encephalitis, 2; encephalitis lethargica, 27; dysentery, 10; ophthalmia neonatorum, 111. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified from the following 23 counties:—London, 10 (Shoreditch 2, Southwark 7, City of Westminster 1); Bedford, 3 (Bedford); Chester, 1; Derby, 7; Durham, 93; Isle of Ely, 1 (Ely); Gloucester, 1 (Chipping Sodbury); Lancaster, 34; Lincoln, Parts of Kesteven 5, Parts of Lindsey 8; Norfolk, 4 (Norwich C.B.); Northampton, 1 (Northampton C.B.); Northumberland, 9; Nottingham, 19; Stafford, 17 (Stoke-on-Trent C.B., 2; Bromwich C.B., 1; Wolverhampton C.B., 2; Newcastle-under-Lyme, 12); Surrey, 2 (Guildford); Warwick, 2; Worcester, 1 (Redditch); Yorkshire, North Riding 15; West Riding 55; Brecknock, 6; Glamorgan, 30; Monmouth, 45.

The number of patients at the Infectious Hospitals of the Metropolitan Asylums Board on Feb. 21st–22nd was as follows:—Small-pox, 25 (6 of these being under observation); scarlet fever, 1737; diphtheria, 2599; enteric fever, 31; measles, 1440; whooping-cough, 181; puerperal fever, 18 (plus 16 babies); encephalitis lethargica, 76; poliomyelitis, 1; "other diseases," 34. At St. Margaret's Hospital there were 13 cases of marasmus and 13 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (1) from enteric fever, 89 (44) from measles, 9 (4) from scarlet fever, 30 (4) from whooping-cough, 42 (9) from diphtheria, 59 (7) from diarrhœa and enteritis under two years, and 83 (5) from influenza. The figures in parentheses are those for London itself. The deaths from enteric fever outside London occurred in Nottingham and Huddersfield. Of the 55 fatal cases of measles outside London 7 were reported from Plymouth, 6 from Bristol, 5 from West Ham, and 4 from Manchester. The number of stillbirths registered during the week was 294 in the great towns, including 62 in London.

Correspondence.

"Audi alteram partem."

EUGENICS AND A NATIONAL STOCK-TAKING.

To the Editor of THE LANCET.

SIR,—I should like to emphasise the suggestion in your valuable leading article last week under this heading that the time has now come for the medical profession to take a deeper interest in genetic problems, and to coöperate in a wisely considered movement to find out how we stand as a nation in regard to the physical and mental qualities of our citizens, and to help forward a sound movement for eugenic reform.

In 1906, in a discussion on the biological foundations of sociology, I made an appeal that systematic instruction in the science of heredity and its application to human life should be included in the medical curriculum. In the Galton Lecture last week I again tried to point out that not only would the study of genetics gain from the utilisation of the unrivalled opportunities possessed by medical men for observing and recording the hereditary transmission of normal and abnormal mental and bodily characters from parents to offspring, and from generation to generation, but that medical science and medical practice would also profit from the wider knowledge so obtained of the influence of "the hereditary factor in disease."

Every medical man who has seriously studied the problem of immunity, innate and acquired, must have sometimes wondered why so much more attention has been devoted in the past to the investigation of the innumerable varieties of pathogenic and non-pathogenic organisms of disease than to the biochemical processes and the cellular activities by which the body tries to repel or to recover from disease. There can be little doubt that a deeper study of both racial and cellular heredity, and of innate capacity of resistance, would throw valuable light on this latter problem. But in order to bring about this change in medical education, a more sympathetic outlook towards genetics must first be secured in the General Medical Council, in the medical faculties in our universities, and in our medical schools.

It is somewhat difficult to fully realise the great advantage which would accrue to our nation and race if our medical profession, general practitioners and professors of medicine, all possessed a sound knowledge of genetic science. Such knowledge would enable them to act as skilled advisers to their patients in matters of the utmost importance from the point of view not only of individual, but of national and racial welfare. Preventive medicine in the truer sense must also depend largely on the application of such genetic knowledge to human societies. Moreover, statesmen and legislators, Government departments, and education and health authorities would be greatly assisted in trying to improve the conditions of life for the people if they could rely upon some well-established scientific knowledge of a biological kind concerning the effect of their schemes on the racial qualities of our people.

It will, I think, be admitted that some at least of our economic regulations and sociological methods are not founded on sound biological principles. They do not look far enough into the future. They are concerned too exclusively with the interests of the individual (in some cases the low grade, degenerate individual), and not enough with the ultimate influence of such schemes on racial welfare. Then there is the great problem of conception control—the world-wide experiment now going on, so potent for good and harm.

If, as I said in the Galton Lecture, it be true that adequate knowledge of the factors which affect fecundity and of the means of controlling conception, when used in a right way, are necessary steps in the evolutionary process whereby man will be enabled to exercise a growing influence over human destiny, and by which also the possibility of increasing the racial stock of innate capacity will be brought within human control, then surely it is the medical practitioners of the country who ought to study this vital and complex problem in all its aspects, in order that they may guide the citizens of all classes along lines calculated to promote racial as well as individual and national welfare.

It is only possible in this short letter to indicate one or two of the many problems which depend upon the application of genetic knowledge to national life. The question of racial deterioration and the possibility of arresting the process of decline is one of increasing importance, and my main object in the Galton Lecture was to point out that we should be wise as a community to take stock of our position, and that we ought to try to find out in what groups or sections of the population, bodily, and especially mental qualities, intellectual and moral characters, and capacity for citizenship, show any signs of improvement or decay. The question of the differential birth-rate, and of the disastrous effect which breeding from inferior and degenerate stocks, if continued long enough, and on a sufficiently large scale, must exercise on the racial qualities of our population, while of great national importance, is also one in which the medical profession should be deeply interested. Medical men must be especially concerned in advising their patients about the important question of marriage from the eugenic point of view, and doctors, perhaps more intimately than others, are in a position to see the disastrous effect of mental defect and other innate disabilities and diseases which arise from, or which may be accentuated by, the marriage of persons who are the subjects of hereditary disease, or who come from degenerate stocks.

In thanking you for your appreciative and discriminating leading article, may I also express the hope that it may lead to a wider interest in genetic and eugenic problems on the part of the medical profession in our own and other countries, and also to the inclusion of some systematic instruction in genetic principles in the medical curriculum.

I am, Sir, yours faithfully,

Leicester, Feb. 27th, 1928. C. J. BOND.

TRANSPLEURAL EXPLORATION OF THE ŒSOPHAGUS.

To the Editor of THE LANCET.

SIR,—We should like to support the plea of Mr. Romanis and Mr. Neilson (THE LANCET, Feb. 25th, p. 386) for transpleural exploration of the œsophagus, and to welcome the signs of coöperation between the general surgeon and the laryngologist in the attempt to secure earlier diagnosis of carcinoma. One of us (A. T. E.) has used the artificial pneumothorax method for exploring the thorax for the past five years, and in our experience also it is easy to expose completely all parts of the intrathoracic course of the œsophagus. For the upper and middle parts the easier approach is from the right side; for the lower, from the left. Whilst it is quite possible to get good access without removing a rib, it is an advantage to excise a very small segment of one, or possibly two, behind the angle. Removal of a growth is a formidable business even when feasible—our only case of actual removal died within 12 hours of shock—but given earlier diagnosis, and increased familiarity of a whole team with the operation, we believe that success will sometimes be attained. Exploration as such can be conducted with little if any more danger than an exploratory laparotomy, and the route certainly opens up possibilities for the more efficient use of radium in the cases unsuited for removal.

We are, Sir, yours faithfully,

E. ROCK CARLING,

London, Feb. 28th, 1928. A. TUDOR EDWARDS.

THE EMPLOYMENT OF TUBERCULOUS PATIENTS.

To the Editor of THE LANCET.

SIR,—Dr. F. N. Kay Menzies's report on the employment of tuberculous workers, which you summarised in a recent issue,[1] will indeed have performed a valuable service if it succeeds in attracting the attention of public bodies to the work being done in this field. It is most difficult to impress laymen with the facts that tuberculosis is a fluctuating and infectious disease, and that it is far more dangerous to health and home than any foreign enemy. In consequence, and largely also because its outward and visible signs do not excite compassion, the public are somewhat apathetic about it, and quite fail to realise that "after-care" is indispensable to every form of the treatment of tuberculosis.

One of Dr. Menzies's points seems, however, to be open to question. He states that "a commercial undertaking employing tuberculous employees and paying a wage adequate for their maintenance cannot be run without serious financial loss. . . ." The experience of Papworth does not bear this out. Papworth industries are a commercial undertaking, employing tuberculous employees and paying a wage adequate to their maintenance, and the average net loss per employee per annum, calculated over eight years, is not more than £3 or £4. This is likely to be decreased as the industries extend; and would almost disappear if adequate capital were available. If this be considered serious financial loss, there is only this to be said: How much greater would the cost be if these persons left Papworth, spread the disease, broke down and had to be readmitted for a further period of sanatorium treatment? In point of fact, if one of them were readmitted for a fortnight to a sanatorium it would cost more than to employ him in the settlement for a year; and if he infected any healthy person as well the cost of *not* keeping him in a settlement would become enormous.

In these calculations no charge in respect of capital is included. If it were, however, the cost per employee would be greatly reduced. It is reasonable, therefore, to contend that public bodies would find an investment in village settlements most valuable; for though it would yield no interest, it would save them large sums in sanatorium charges on readmitted cases and pay dividends of happiness to their beneficiaries. This latter point is, I think, of some importance, though it cannot be brought, unfortunately, into the scale against pounds, shillings, and pence.

I am, Sir, yours faithfully,
P. C. VARRIER-JONES.

Papworth Hall, Cambridge, Feb. 22nd, 1928.

PREVENTION OF DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—Dr. Massingham's letter in your issue of Feb. 25th rightly records facts of much importance as regards the validity of the Schick test, which await a future explanation and that suggested "further research," to account for what are apparent "borderline" anomalies in the rare instances of the reported occurrence of clinical diphtheria in Schick-negative individuals, if indubitable and authenticated, as the cases quoted are seemingly claimed to be. The subject finds reference in the Medical Research Council's report on the "Prevention of Diphtheria," published last May, and at the risk of trespass on your valuable space, quotation of a paragraph on page 15 headed "Occurrence of Diphtheria in the Schick Negative," would seem appropriate.

In view of a certain, if small, number of instances in which an apparently genuine Schick-negative reactor has been reported to have contracted diphtheria, it would seem necessary to assume that the amount of antitoxin present—i.e., in the circulating blood—at any given time does not represent a fixed and unchanging quantity, but that variations in *some* individuals may occur, and that in such cases contact with a massive diphtheria infection may be sufficient to upset the finely balanced defensive mechanism and to give rise to an attack of clinical diphtheria, though one usually modified in character. Such cases as have been reported require very careful and critical study before the diagnosis can be accepted as correct; first, as regards accuracy of technique and reading of the result of the Schick test; secondly, with reference to the clinical and bacteriological condition notified as diphtheria; and, thirdly, as to the antitoxin content of the patient's blood. The possibilty of a carrier condition of diphtheria bacilli and supervening tonsillitis, due to some other organism, might well account for a case being notified as diphtheria, and so by casting suspicion on the true value of the test, lead to an imputation of fallacy. Whatever the explanation may be, however, the facts for and against suggested fallacy demand the strictest inquiry and unbiassed interpretation.

Further on reference is made to a few conflicting results quoted by Dr. B. A. Peters[1] in 1922 at Bristol, who pointed out then the possibility of fallacies as to the interpretation of the test, but at a later date suggested that although a Schick-negative result always indicated a comparatively high immunity, under the exceptional circumstances of exposure of fever hospital staff to virulent infection in massive doses, the negative response might not *always* mean *complete* clinical immunity.

Dr. E. H. R. Harries,[2] with his wide experience of the value of the Schick test, also recently made reference to similar cases (in a paper read before the Epidemiological Section of the Royal Society of Medicine, Nov. 25th, 1927) and was of opinion that they were instances of "diphtheria tonsillitis" in an immune, and that although following infection a membrane was visible on the fauces, it always presented the same characteristics, was very thin and easily stripped without leaving a bleeding surface—separating spontaneously to leave the fauces apparently normal—such cases never suffered from the toxæmia of diphtheria nor required antitoxin, as the faucial infection, acting as a secondary stimulus, very rapidly raised the antitoxic titre of the blood. To this category Dr. Massingham's cases very possibly belong.

I am, Sir, yours faithfully,
J. GRAHAM FORBES.

County Hall, S.E., Feb. 27th, 1928.

GASTRO-DUODENAL ULCERATION.

To the Editor of THE LANCET.

SIR,—In view of the convincing letters you have published from Dr. J. A. Ryle and Dr. T. Izod Bennett I had not intended to join in the discussion on this subject, but as Dr. A. J. D. Cameron suggests in your issue of Feb. 25th that Prof. MacLean was the first in this country to write on the intensive alkaline treatment of ulcer, I should like to draw his attention to a paper of mine on the Pathology, Diagnosis and Treatment of Gastric and Duodenal Ulcer, which appeared in the *British Medical Journal* of April 24th, 1920. I there stated that in common with many other physicians I had given alkalis for many years, but that after a visit to Sippy's Chicago clinic in July, 1919, I had used a modified form of his ntensive treatment, which I proceeded to describe in detail.

Three years later, in June, 1923, at about the time Prof. MacLean says he first gave alkalis to patients with ulcer, I had reason to believe that the treatment was already so widely used by practitioners throughout the country that I thought it right to publish in *The Lancet* and *British Medical Journal* a warning as to the danger of toxic symptoms. So far from being a "bogy which need not be feared," as MacLean and his colleagues state, alkalosis is a very real danger, especially in patients with any gastric stasis or with renal insufficiency, which may be so insignificent that it can only be recognised by estimating the blood-urea. I have seen one fatal case and several others have been reported. My colleague, Dr. J. F. Venables, described a series of severe cases of

[1] THE LANCET, Feb. 4th, p. 246.

[1] THE LANCET, 1923, ii., 784; and 1924, i., 821.
[2] Proc. Roy. Soc. Med., Dec., 1927, p. 197 and p. 210.

alkalosis following alkaline treatment of ulcer in the *Guy's Hospital Reports* for 1925. For some reason the condition has in my experience only occurred in private patients, which may account for the fact that Prof. MacLean has not observed it in his hospital unit, but it is none the less important for the practitioner to recognise the first signs of alkalosis so that the treatment may be discontinued without delay.

The correct dosage of alkalis is a very complicated physicochemical and biochemical problem, which is at present the subject of active investigation at Guy's Hospital. The value of the mixture recommended by MacLean is entirely due to the sodium bicarbonate and magnesium carbonate it contains, as the work of Mr. E. Matthews, which will be shortly published in our *Reports*, shows that bismuth carbonate is almost completely devoid of neutralising power. On the other hand, the 10 grains of sodium citrate, which MacLean, in common with most physicians, gives with each feed in order to prevent coagulation of the milk, has almost the same neutralising power as the 12 grains of sodium bicarbonate he gives every two hours.

Prof. MacLean writes, in reference to infected teeth, that "unless we are misinformed with regard to the general attitude of the profession on the subject, there is at present little risk of the teeth, septic or otherwise, being overlooked." From my experience I should say that he certainly has been misinformed, as out of 126 consecutive cases of duodenal ulcer at New Lodge Clinic 25 per cent. had well-marked pyorrhœa alone, 9 per cent. had apical infection alone, 40 per cent. had both, 8 per cent. were edentulous, and only 18 per cent. had healthy teeth. The corresponding figures for 30 cases of gastric ulcer were 23, 20, 21, 13, and 23 per cent. respectively.

I am, Sir, yours faithfully,

ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, Feb. 27th, 1928

MASTOID OPERATIONS.

To the Editor of THE LANCET.

SIR,—It is interesting to read in your current issue Sir Charles Ballance's retrospect. Doubtless he looked back and was influenced by his teachers when he designed his own operation. His, like theirs, seems to attract little attention in these days. On the other hand, I looked forward and was not at all influenced by the work of my predecessors when designing my method of operation, because I had learnt a great deal by observing Nature's attempts to cure mastoid disease, and based my technique on these.

Dr. Percy Jakins, of the Central London Ear and Throat Hospital, was the first surgeon to visit the Throat Hospital to see me perform one of these operations. He made this remark in the operating theatre: "Your operation will take the place of all Schwartze operations and most of Stacke's radical ones." Evidence of the soundness of his opinion was forthcoming last week, for on the 23rd inst. I performed one of these operations, exhibited a cured patient, and subsequently lectured on Diagnosis in Mastoid Disease at the Burton-on-Trent Hospital by invitation of the local Medico-Chirurgical Society. There I was informed that 76 mastoid operations had been performed in the hospital in the past year, that 74 of these were carried out by my method, and two by Stacke's (radical) method—the radical measure being adopted on account of the presence of cholesteatoma in the attic.

I may mention that many aural surgeons have informed me that they perform no mastoid operations except by my method; I hope, before long, that all large towns will be competent to deal with the ear diseases that occur in them.

I am, Sir, yours faithfully,

CHARLES J. HEATH.

Devonshire-place, W., Feb. 27th, 1928.

THREE CONCEPTIONS OF TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—In his kindly criticism of my paper in your issue of Feb. 4th (p. 259), Dr. Blanford takes the view that whenever symptoms and signs suggestive of pulmonary tuberculosis are present the disease is serious; the outcome cannot be foretold, and sanatorium treatment should be advised; but with efficient medical examination this means sending 30 to 40 per cent. of the population to sanatoria at some time in their lives, most of whom would recover just as well at home. To-day the great majority of these cases recover undiagnosed, there may be suspicions in the practitioner's mind, but he hesitates to name the complaint until an exact diagnosis can be made, which sometimes means that the disease is no longer "minor." In this way special treatment may be dangerously delayed in low-resistant patients. If the real frequency of symptoms due to tuberculosis were generally realised this diagnosis would be much more common, based it is true on ground less sure than at present, though just as scientific as most other diagnoses in general practice. There would then, I think, be more observation, people in time would be less apprehensive, and special treatment more readily adopted.

An acute case is unsuitable for the sanatorium. It is the border-line case with some resistance, but not doing well at home, that will benefit there, and nothing is lost for such patients by three months' observation and treatment at home. There are, of course, certain conditions which make immediate sanatorium treatment advisable:—

1. A positive sputum.
2. A bad family history.
3. Very bad surroundings.
4. Patient has not improved with home treatment.

The constant iteration that early cases must be sent at once to a sanatorium has led to a false position. Some minor cases are sent there unnecessarily (some to be returned with the diagnosis unconfirmed), and in other instances the supposed necessity for such a step dangerously delays the diagnosis. In dealing with tuberculosis, the point where medical experience and skill are of the highest value is not so much in making a diagnosis, but in deciding what should be done for the individual patient. If the mere existence of tuberculosis necessitated sanatorium the matter would be simple, and the recent innovation of appointing junior men to act as school medical officer, welfare officer, assistant medical officer of health, *and tuberculosis officer* would be justified; but the matter is not so simple, and a lifetime is not too long to learn how to treat the individual patient.

The experience of the sanatorium officer is likely to be wider, and his advice more sound, in dealing with major tuberculosis, but the tuberculosis officer has the advantage in advising about tuberculosis as met with in everyday practice.

I am, Sir, yours faithfully,

Paignton, Devon, Feb. 21st, 1928. E. WARD.

INCIDENCE OF THE MINOR PSYCHOSES.

To the Editor of THE LANCET.

SIR,—The views of Dr. T. A. Ross and myself are so much in accord that I can treat his letter in your issue of Feb. 25th only as an opportunity of defining my position when I challenge the current usage of words like "neurosis." I am in agreement with him as to the important difference between the groups that I call major and minor psychoses, and also as to the need for using words that our patients, and their friends, will not misunderstand. I regret that the word "benign" did not occur to me instead of "minor," which was suggested by the French *petits mentaux*.

In talking to patients I have, like him, to accept their distinction between "nervous" and "mental," and this distinction would be useful and harmless if it were recognised that, like hysteria, some of these

words do not mean what they appear to mean. The history of neurosis, as shown by quotations in the Oxford English Dictionary, indicates a perversion of meaning that has resulted in perversion of thinking. Originally it meant an interference with physiological nerve function; lead colic was a neurosis, and a writer speaks of the functional disorders as including "neuroses, hæmorrhages, and dropsies." Then in the 'seventies philosophical speculation led to the definition of a neurosis as "a change in the nerve cells of the brain prior to and resulting in psychic activity," and this metaphysical conception became linked with clinical use so that we find Maudsley writing of "insanity, epilepsy, and other neuroses." There was no objection to this use of the word as expressing the idea of one aspect of a condition or action, the other aspect being the psychosis, so long as it was not confused with the older meaning. It implied the axiom "no psychosis without neurosis."

Now, however, obverse and reverse have become separate coins, and paranoia is a psychosis whilst an obsessional state is a neurosis; I do not know why, and I do not think anyone else knows. To many of us the label "neurosis" indicates a histopathology, some change in nerve towards the discovery of which our efforts should be directed. But our efforts are not so directed. When my attention was turned to the study of miner's nystagmus—now costing us half a million a year—I could find no record of any pathological investigation of that occupational neurosis. The word is apparently not a stimulus to such investigation. On the other hand, it does serve the purpose of enabling us to turn aside from the psychological study of conditions which, in my belief and the belief of Dr. Ross, can be usefully approached by that route. Telegraphists' cramp is called a neurosis and, until the investigation I was enabled to carry out for the Fatigue Board, I had no conception of the wealth of psychological material that underlies the symptoms of that disorder. Our text-books actually present students with speculations about the location of a lesion that allows one man to use the Morse key perfectly so long as it is attached to a recording tambour, but that causes cramp when he knows the key is attached to a telegraph wire; or allows another man to send every combination of dots and dashes except those indicating the hard-sounding letters C, K, and Q; or produces painful cramp in another as soon as he sits down in the position of sending. Our connotation of the word neurosis directly encourages the prescription of *Linimentum saponis* for these vagaries of behaviour.

These remarks apply to all those words, even the word nervous, that imply a non-existent pathology. Elsewhere I have quoted approvingly the phrase of Dr. Johnson in a letter to Mrs. Thrale: "A tender, irritable, and, as it is not very properly called, a nervous constitution." Dr. Ross has written an admirable book called "The Common Neuroses"; I have written a book called "The Nervous Patient." I certainly bowed to custom in my choice of title, and probably Dr. Ross did likewise; my only claim to superiority is that my idol was older than his.

This attack upon nomenclature is not in the interests of linguistic purity, but is an effort to induce a more helpful attitude towards what I shall still call, when untrammelled by custom, the benign or minor psychoses. The word neurosis should be restored to its original meaning; there is need for it in classifying such disturbances as hysterical dermatographia, mucous colitis, some dyspepsias, tachycardias and asthmas, where it may be convenient to consider them as disturbances of the physiological function of nerve tissue.

In only one fact of observation do I find myself differing from Dr. Ross. Fear of the dark in childhood is not universal; I know intimately one child who never suffered from it and was perplexed and annoyed on discovering it in a playmate.

I am, Sir, yours faithfully,

London, Feb. 27th, 1928. MILLAIS CULPIN.

CARBON DIOXIDE IN ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—Dr. Birt's letter in your last issue reaches conclusions regarding carbon dioxide in anæsthesia which are at variance with my experience. During three years I have used carbon dioxide in anæsthesia for some hundreds of major and minor operations in infants, children, and adults, and I regard it as a very important part of the anæsthetist's equipment. I invariably use a sight-feed bottle, usually a triple one (made by Coxeter), and with it I have complete control of the gas as well as considerable accuracy in its percentage, and very rarely has there been cause for the least anxiety in its administration. To be able to increase the respiratory excursion by means of a small percentage (1–5) of carbon dioxide and thus facilitate and hasten the induction of anæsthesia is of great importance, especially in infants and children whose tidal wave is relatively small. The benefit is not less apparent in adults where frequently preliminary morphia has depressed the respiratory centre. With carbon dioxide the great majority of such patients experience a rapid and easy induction of anæsthesia. In my[1] experience, except in old people, the rapid and complete elimination of the anæsthetic agent by means of carbon dioxide is a potent factor in convalescence.

I am, Sir, yours faithfully,

Aberdeen, Feb. 28th, 1928. J. ROSS MACKENZIE.

ULTRA-VIOLET RAYS AND VARICOSE ULCERS.

To the Editor of THE LANCET.

SIR,—In your report last week of a meeting at the Medical Society of London it appears (p. 392) that Dr. Heald, discussing recent claims that "varicose ulcers uniformly yielded to, and could be cured by, ultra-violet light," stated that Dr. Dora Colebrook, "following the exact technique of the man who made the claim," had met with complete failure. As several people, amongst them myself, have claimed that ultra-violet radiation was of value in the treatment of varicose ulcers, would it not have been more fair to have given the name of the man whose technique Dr. Colebrook followed? It would at least have given him an opportunity to reply. Moreover, to make a mystery of his identity is an unwelcome departure from the customary practice of giving references. There have been so many claims and denials as to the value of ultra-violet in the treatment of ulcers, that it would appear that the time has arrived for the subject to be given a full evening's discussion to itself. Hitherto it has but been mentioned in discussion on ultra-violet in general.

I am, Sir, yours faithfully,

London, W., Feb. 27th, 1928. M. WEINBREN.

[1] British Journal of Anæsthesia, October, 1926, p. 92.

MEDICAL PRACTITIONERS' UNION.—This Union held a dinner and dance at the New Princes' Galleries on Feb. 23rd. When the loyal toast had been honoured the health of the Union was proposed by Dr. Graham Little, who declared that the M.P.U. was fighting for some of the most important principles in medicine, and that in Parliament it was making history. The profession had at the present time a remarkable opportunity for usefulness to the community and for its own advancement and status, and it ought to be more united. Few doctors were willing to make the sacrifice of time, money, and effort necessary to hold seats in Parliament, but it was most important that they should be more adequately represented. Dr. E. A. Gregg, the President, in replying, said that he was more convinced to-day than ever of the need for his organisation, which was trying to do for doctors what no other professional organisation attempted. The M.P.U. wanted to emphasise first of all the doctor as doctor, and secondly to face the modern problems of the doctor's contact with the public at large. The health of the guests was proposed by Dr. G. de Swietochowski, and Sir William Arbuthnot Lane replied.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS

HEALTH INSURANCE IN SCOTLAND.

ON Thursday, Feb. 23rd, the House of Commons went into Committee of Supply on the Supplementary Civil Estimates, 1927, Captain FITZROY in the chair.

On a supplementary estimate of £10 for the salaries and expenses of the Scottish Board of Health, including grants for National Health Insurance and other purposes,

Sir JOHN GILMOUR, Secretary of State for Scotland, said that since this matter had been very fully debated on the English supplementary estimate it would be unnecessary for him to go very fully into it. He would like to say, however, that it was a matter of very grave concern both to the approved societies and to the minister concerned that there should have been this very large increase in expenditure. The expenditure commenced to rise in 1926 very markedly after the stoppage in the coal industry and continued at an abnormally high rate until the end of 1926, necessitating a supplementary estimate in that year. It was expected that it would decline, but unfortunately that had not been the case. The expenditure on sickness and disablement benefit during 1927 was even heavier than in 1926. For example, after allowance for extra expenditure on additional benefits, if they took the index figure for 1925 as 100 the figure for 1926 was 113·5 and for 1927 117·75. It was very difficult to find any explanation of this high expenditure. Apart from an epidemic of influenza in March last year 1927 had not been an unhealthy year, whether it was judged by the mortality figures or by other standards such as the number of prescriptions issued by the medical practitioners in Scotland to their insured patients. It might be that those who had been out of work for some period through the long industrial depression might have sought this channel in increasing numbers to obtain relief. It was clear, too, that there was a great feeling of apprehension on the part both of the approved societies and those connected with them that the medical profession was not taking that amount of care in giving this relief that might be expected of them. Already the Scottish Board of Health had taken steps to call the attention of the approved societies to this huge increase and had been in consultation with the representatives of the medical profession. He would not say at that stage what steps in addition to those already taken could be taken to help in this matter, but it was clear that such steps as, for instance, not allowing the transfer of an applicant from one medical practitioner to another except within a certain period might have some slight effect. The period had already been increased and it might have to be further increased. In any case they would carefully watch these matters and in the long run, if there were flagrant examples of medical practitioners failing to carry out their duties reasonably, other steps would have to be taken. It was satisfactory that in asking for authority to meet this increased expenditure he was not asking the House for extra money. They had been able in the estimates which Parliament had already voted for his department to make certain savings upon the item of steel house construction. They had proceeded with 500 houses less than they intended, and it was proposed to transfer a portion of this saving to meet the extra expenditure under this vote which amounted to about £40,000.

Housing and Health.

Mr. JAMES STEWART moved to reduce the vote by £5. He said that the need for houses was growing greater and greater in Scotland. There had been built from 1919 to the present time 67,000 houses, whereas in the nine years, at the rate of 20,000 houses per annum, there ought to have been built 180,000 houses. So the shortage had grown from 121,000 to nearly 230,000, not with an improved standard, but merely to keep things as they were. What was the use of increasing medical benefit, and spending more money in health administration when the problem which was the source of nearly all the troubles that beset them began in the house and ended in the house through the bad conditions which obtained? While it was true that their infantile death-rate this year was the second lowest in their history—namely, 82 against 79, their lowest—in other parts of the world, not more happily situated in regard to climate and other conditions than they were, the death-rate was ever so much lower. They were asked to accept that sort of thing as something with which they had got to be satisfied in spite of the tremendous development in medical science and the fact that their medical officers to their credit in every municipality in Scotland had year in and year out been drawing attention to the relationship between housing and health generally. In the densely populated quarters of Glasgow the infantile mortality-rate was three times the average for the city. In this way they were filling their hospitals and increasing their expenditure in every direction. The Government must take a step forward to meet the circumstances of the great industrial centres. In Glasgow over £600,000 had been spent annually on health administration of which a considerable proportion had to be met by the city. This expenditure was ever growing, yet the cause of it all was left practically untouched, nay, worse than untouched, for it was being allowed to develop into a festering sore which was cutting off lives which could be saved and which would perhaps be of great advantage to the State in its hour of need, should that come again.

The Discretion of the Doctor.

Mr. KIDD said that there was only one point which made him a little suspicious of the Secretary for Scotland and that was his reference to the extra cost incurred through increased sickness. He would ask the right hon. gentleman to remember that last year Scotland was still suffering a violent reaction from the coal stoppage, and incidentally it had been the wettest season on record. The weather, taken in conjunction with the lowered vitality of the people following the stoppage, readily accounted for the increased sickness. He would ask the Secretary for Scotland to be slow to assume that medical practitioners in Scotland had been a little too facile in allowing panel patients medical treatment, or too slow in turning them off the list. One ought seriously to hesitate before interfering with the discretion of the doctor, because otherwise with whom was the supervision to rest? Was the doctor to be supervised entirely by official medical men representing the Ministry, or was he in order to support his case to have the assistance of other panel doctors? He put that point the more anxiously because he had found cases where objection was taken by a doctor to his being overridden on the question of the quality of the medicine he had prescribed. One did not want to create the impression that there were two classes of patients, the patient who was on the panel and the patient who was not, so far as the prescribing of medicine was concerned. If they raised a question of that kind they would bring the Insurance Act into disrespect and make it very suspect. The discretion of the panel doctor might not be exercised legitimately in every case, but he had heard of it being challenged in the case of medical men whose repute was beyond all doubt, and if they spread the idea that doctors had been slack they would start on a thorny path.

Mr. SCRYMGEOUR said he would like to know what evidence there was in Scotland for this strange report concerning medical men and the allegation that they were not properly looking after the interests of approved societies and their funds through failure properly to supervise cases which came to them for treatment. There was a case in Dundee recently in regard to which the doctor according to his own explanation to him (Mr. Scrymgeour) took very great care. The doctor decided that a patient ought to be put off benefit because he conscientiously thought that she was able to resume work. As a matter of fact that was far from being the case, and the patient got worse. The doctor had explained that if the patient had come back and said that she could not manage to work he would have put her on to benefit again. That was an instance which showed that a doctor was over-careful in handling a case. He did not think that there was any substantial ground for saying that doctors were slack in attending either to the interests of the patients or to those of the approved societies. If such a state of things prevailed they would have very clear proof of it through representations made before the Insurance Committee or to some of the approved societies.

Mr. STEPHEN said that the Secretary for Scotland had no evidence to show that the medical men in Scotland were not acting properly in this matter, and he hoped that the House would think very seriously before they allowed the right hon. gentleman to impose new conditions on the medical profession in order that doctors might be bullied into sending people to work when they were unfit to work. The increased expenditure was due to the failure of the right hon. gentleman's own policy, and it was no use for him to try to put it on to the medical profession. He wished to know why in Glasgow there had not been the regular election of the medical panel in connection with health insurance? He understood that medical men in Glasgow had been pressing for that election and yet the Secretary for Scotland had refused to have it. Evidently the right hon. gentleman thought that he would be able to bully them successfully in this matter.

Increased Independence.

Sir H. CAUTLEY said he had been much interested in what the Secretary for Scotland had said as to the steps that were being taken to make the doctors more independent than hitherto. The figures as to the increase in sickness and disablement benefit during the last three years were very serious. From his connexion with the working of the approved societies he could say without hesitation that the doctor's position had hitherto been such that in numerous

cases the desire to do his duty had brought him into conflict with his patient, and that had placed him in a very difficult position. He had no charge to make against the doctors as a whole. The cure for this thing, in his opinion, was to increase the doctor's independence. He had long thought that there ought to be a period of time elapse before a patient could change his panel doctor.

Mr. WESTWOOD said that a complaint had been lodged in different parts of the country, and certainly in his constituency, that medical men were forming themselves into a limited liability company so that they could dispense the medicines which they themselves had prescribed. In the original Act it was laid down that a medical man should not, unless under very exceptional circumstances, dispense his own prescriptions. But the doctors were getting over the difficulty in the way he had mentioned. In the particular case to which he had referred the prescription instead of being handed to the patient was taken away by the medical man himself to be dispensed. He hoped that an inquiry would be made into this matter.

Reply to the Debate.

Sir JOHN GILMOUR, replying to the debate, asked who were the people concerned in sickness benefit? One would imagine listening to some hon. members that it was only a flinty-hearted Government or the Scottish Board of Health. The people, however, who were as much concerned in this matter as anyone were the administrators and members of approved societies. The number of cases on which grave doubt had arisen as to whether excessive payments were made or not had materially increased. In 1925 the number of cases referred for examination—that was cases upon which doubt was expressed—was 22,231. They rose in 1926 to 42,016, and they were as high in 1927 as 35,068. In regard to cases examined by the referee, in 1927 the medical practitioner's certificate was upheld in the case of men to the extent of 45 per cent. of those examined, and in the case of women to the extent of 35 per cent. The practitioner's certificate was reversed in 21 per cent. of the cases in respect to men and 24 per cent. in respect of women. Of the cases which were referred but not examined 15 per cent. were declared off the fund in respect of men and 19 per cent. in the case of women; and there were not examined for various other reasons 5 per cent. in the case of men and 3 per cent. in the case of women. He had found it necessary to say quite plainly to the House that there were some members of the medical profession who they were convinced were not observing as carefully as they should the duties which were laid upon them. One must recognise the great difficulties under which no doubt many of these cases were dealt with, but the fact remained, and it was one which he desired to emphasise. He hoped that the medical profession would assist them and the societies concerned and that they would not be compelled to take other and more compulsory methods. In regard to the question raised about the election to the medical panel, that was not proceeded with because there was a doubt as to whether they would be continued in view of a recommendation of the Royal Commission. If Mr. Westwood would send him any particulars he had about medical practitioners he would at once have the matter investigated.

The motion to reduce the vote was rejected by 229 votes to 89.

HOUSE OF COMMONS.

MONDAY, FEB. 20TH.

Export of Opium from India.

Mr. CAMPBELL asked the Under Secretary of State for India what amount of opium was exported from India in the years 1926 and 1927; what was the total amount of opium produced in India in those years and the revenue derived therefrom; and to what countries the exported opium was consigned.—Earl WINTERTON replied: In 1926 exports were 1,224,140 lb., including 88,000 lb. of medical opium sent to this country; the other destinations being French Indo-China, Malaya, Netherlands, East Indies, Siam, Hong Kong, Sarawak, State of North Borneo, Ceylon, and Zanzibar. In the same year the produce of the acreage in British India was 1,082,700 lb. The net opium revenue of the Government of India for 1925–26 was Rs. 2,03,52,437. Later figures are not available.

Beds in Military Hospitals.

Colonel WOODCOCK asked the Secretary of State for War how many beds there were available in the military hospitals in this country; what was the maximum number occupied on any one date of last year; and what was the annual average number of beds occupied.—Sir L. WORTHINGTON-EVANS replied: The answer to the first part of the question is 3454, to the second, 3277, and to the third, 2061.

Colonel WOODCOCK asked what was the estimated daily cost of each occupied hospital bed and how the cost was approximately made up.—Sir L. WORTHINGTON-EVANS replied: The estimated average cost of an occupied bed a day in the seven large hospitals for which cost accounts are now kept is (*a*) 14*s.* 6*d.* if the cost of unoccupied beds is charged to the occupied beds, and (*b*) 10*s.* 6*d.* if this cost is excluded. The cost is made up approximately as follows:—

	(*a*)	(*b*)
	s. *d.*	*s.* *d.*
Patients: maintenance ..	3 6	3 6
Staff	7 4	4 8
Standing charges	3 8	2 4
	14 6	10 6

Factory Inspectors in Scotland.

Mr. BUCHANAN asked the Home Secretary the number of factory inspectors appointed in Scotland; if this was the full number allocated for Scotland; if not, when he intended to increase the numbers; and the numbers of inspectors in the same area in 1914.—Sir W. JOYNSON-HICKS replied: The staff now allocated to Scotland comprises 19 inspectors and two inspector's assistants. It is at full strength except for a recent vacancy, caused by the death of an inspector, which will be filled shortly. The staff in 1914 consisted of 16 inspectors and five assistants. The total number, therefore, was the same in both years.

TUESDAY, FEB. 21ST.

Holloway Prison Hospital Staff.

Mr. HAYES asked the Home Secretary the number of staff, superior and subordinate, employed in connexion with the Holloway prison hospital and the daily average of patients in the hospital for October, November, and December last.—Sir W. JOYNSON-HICKS replied: The medical staff at Holloway consists of the governor, who is also the medical officer, and two junior medical officers: the nursing staff consists of one hospital lady superintendent and 26 nurses. The daily average population of the hospital was 111 in October, 96 in November, and 113 in December last.

Opium Cultivation in British India.

Mr. WALTER BAKER asked the Under Secretary of State for India whether official estimates were regularly prepared for the government of India of the total area under opium poppy in British-Indian territory; whether these estimates and later corrected estimates were issued by the Government for public information; whether he would inform the House of the estimated and the actual area devoted to opium poppy cultivation in the year 1926–27; and if any estimate had been published of the probable area so cultivated during the year 1927–28.—Earl WINTERTON replied: The answer to the first part of the question is in the affirmative. The area engaged and that actually cultivated are stated in the report of the Opium Department published after the end of the year. The last report received here is for the year ended October, 1926. The following are the figures in acres for that and the preceding year:—

	Land engaged for.	Land actually measured and cultivated.
1924–25	111,953	114,198
1925–26	72,180	71,057

Army Hospital Accommodation in Portsmouth.

Sir FREDERICK HALL asked the Secretary of State for War what hospital accommodation was provided for Army purposes in the Portsmouth district; what was the number of patients that could be dealt with and what was the average number in residence; and what was the annual cost of upkeep.—Sir L. WORTHINGTON-EVANS replied: There is now no military hospital at Portsmouth. Military personnel are treated either in the Royal Naval Hospital, Haslar, or in the Royal Victoria Hospital, Netley.

WEDNESDAY, FEB. 22ND.

Beds in Service Hospitals.

Colonel WOODCOCK asked the First Lord of the Admiralty how many beds there were available in the naval hospitals in this country and what was the maximum number occupied on any one day of last year.—Lieut.-Colonel HEADLAM, Parliamentary Secretary to the Admiralty, replied: The reply to the first part of the question is 1912 and to the second, 1804.

Colonel WOODCOCK asked the Secretary of State for Air a similar question.—Sir S. HOARE replied: The answer to The first part of the question is 440; to the second, 368 the annual average number of beds occupied was 266.

Poor-law Relief.

Lieut.-Commander KENWORTHY asked the Minister of Health if he had any estimate of the number of persons in receipt of poor-law relief at the present time.—Sir KINGSLEY

WOOD, Parliamentary Secretary to the Ministry of Health, replied: As regards the first part of the question the number of persons in receipt of poor-law relief in England and Wales (excluding lunatics in county and borough asylums, casual, and persons in receipt of domiciliary medical relief only) on Saturday, Feb. 4th, 1928, was 1,208,179.

Tuberculosis in the Navy and Army.

Mr. HORE-BELISHA asked the First Lord of the Admiralty the number of men discharged from the Navy in 1927 suffering from tuberculosis and in how many cases was the disability attributable to service and disablement pension awarded.—Lieut.-Colonel HEADLAM replied: The numbers are 180 and 18 respectively. Pensions were granted on the attributable scale in the 18 cases and on the non-attributable scale in the other cases where the men had sufficient service to qualify.

Mr. HORE-BELISHA asked the Secretary of State for War a similar question.—Sir L. WORTHINGTON-EVANS replied: The number of soldiers discharged from the Army during 1927 on account of pulmonary tuberculosis was 201. 53 cases were regarded as attributable to military service and pensions awarded, and in 88 other cases non-attributable gratuities were granted.

Men Invalided from the Army.

Mr. HORE-BELISHA asked the Secretary of State for War how many men invalided from the Army in 1927 and denied pensions on the ground of non-attributability appealed to the War Office against the original decision; and in how many cases was the decision modified.—Sir L. WORTHINGTON-EVANS replied: The approximate number of men invalided from the Army during 1927 whose disability was considered as non-attributable who appealed or whose cases were referred to the War Office by the Chelsea Commissioners for further consideration was 200. In 77 of these cases the decision was modified. It is not possible to distinguish between appeals made by the men themselves and cases referred to the War Office by the Chelsea Commissioners.

Nystagmus Patients and Unemployment Benefit.

Mr. THOMAS WILLIAMS asked the Minister of Labour whether coal miners suffering from nystagmus were granted unemployment benefit.—Sir ARTHUR STEEL-MAITLAND replied: Coal miners suffering from nystagmus and not in receipt of full compensation under the Workmen's Compensation Acts are in general eligible for unemployment benefit subject to the usual statutory conditions. While I have no statistics on the point I have no reason to suppose that the proportion of disallowances of claims made by such miners is higher than the average. The receipt of partial compensation under the Workmen's Compensation Acts is not a disqualification for benefit, but those in receipt of full compensation would presumably be incapable of work and therefore ineligible for benefit.

Cost of National Health.

Mr. DENNISON asked the Minister of Health the amount expended per annum under the National Health Insurance Acts on sickness and disablement, medical, dental, ophthalmic, hospital, and convalescent homes; and the number of insured persons to whom such benefits were available.—Mr. N. CHAMBERLAIN replied: The amount expended per annum under the National Health Insurance and the number of insured persons vary from year to year. In the year 1926 for Great Britain the amount expended on sickness and disablement benefit and on medical benefit respectively and the mean number of persons to whom those benefits were available were approximately as follow:—

	Amount.	Mean number of persons.
Sickness and disablement	£18,721,000	15,100,000
Medical	9,536,000	15,886,000

The precise amount expended on each of the additional benefits specified in the question cannot be given separately, but the total amount expended on all additional non-cash benefits in the year 1926 was £1,864,000. Inasmuch, however, as the present schemes of additional benefits only commenced in July, 1926, for the great majority of insured persons, the expenditure in 1927 on such benefits was considerably higher and is estimated to have been about twice that for 1926. The annual amounts available, as at July 1st, 1927, in England only for certain benefits, and the numbers of members of societies giving such benefits, were approximately as follow:—

	Annual amount.	Numbers of members of societies giving benefit.
Dental	£2,589,000	12,338,000
Ophthalmic	413,000	11,563,000
Hospitals	292,000	8,656,000
Convalescent homes ..	208,000	9,817,000

THURSDAY, FEB. 23RD.

Ex-Service Men and Medical Treatment.

Mr. COMPTON asked the Minister of Pensions what was the cost per head per week of ex-Service patients under medical treatment in institutions belonging to the Ministry and in voluntary hospitals during 1925, 1926, and 1927.—Major TRYON replied: The table shows the cost per week per ex-Service patient in institutions belonging to the Ministry as compared with the corresponding cost of ex-Service patients in other hospitals for the years 1925, 1926, and 1927:—

Year.	Ministry Institutions.	Other hospitals.
	£ s. d.	£ s. d.
1925	3 0 7	2 19 8
1926	3 0 6	2 18 11
1927	3 0 3	2 18 7

Comparison of the cost per head as between the two classes of institution is necessarily affected by the fact that in institutions controlled by the Ministry the entire medical staff is salaried. Moreover, it is to be remembered that the Ministry only maintain separate institutions for treatment where that course is necessary to supplement existing civil accommodation or to provide treatment for special classes of disability for which hospital treatment is not otherwise available.

Mr. HAYES asked the Minister of Pensions the number of established and unestablished whole-time medical officers employed by the Ministry during 1923, 1924, 1925, 1926, and 1927, and the average number of ex-Service cases under treatment during the same period.—Major TRYON replied: The numbers of established and unestablished whole-time medical officers (including the whole-time medical staffs of Ministry institutions) employed by the Ministry during the years in question were as follows:—

Year.	1923.	1924.	1925.	1926.	1927.
Established ..	3	3	50	50	50
Unestablished ..	544	452	329	222	190

The average numbers of ex-Service men receiving treatment during these years were 71,000, 56,500, 44,600, 34,700, and 27,700 respectively.

Mr. CONNOLLY asked the Minister of Pensions if the proposed new hospital was to be in Dunston, Gateshead, and whether it was proposed to administer the hospital in association with the Dunston after-care home for disabled ex-Service men maintained out of the County of Northumberland War Relief Fund.—Major TRYON replied: The answer to the first part of the question is in the affirmative. The premises which are known as Dunston Hill House, Dunston-on-Tyne, were formerly occupied by the Northumberland Naval and Military War Pensions Voluntary Fund. The administration of the hospital will be in the hands of my Ministry, but I have every reason to hope that some, if not all, of the members of the Committee of the Northumberland Voluntary Fund will serve as members of the Welfare Committee of the new hospital when it is ready for occupation.

Mr. STEPHEN asked the Minister of Pensions the number of ex-Service men, suffering from disability of any kind, for whose care the Ministry was responsible who are being treated in institutions belonging to local authorities in Scotland and England respectively.—Major TRYON replied: The number of ex-Service men who are in receipt of treatment at the cost of the Ministry in institutions belonging to local authorities was, at the end of January, approximately 5300 in England and 800 in Scotland.

Small-pox in Aspull and Hindley Areas.

Mr. RHYS DAVIES asked the Minister of Health the number of small-pox cases in the Aspull and Hindley Urban Council areas during the period from Jan. 1st, 1927, onwards to date; what were the causes of the outbreak; and what steps were being taken to prevent the disease spreading.—Mr. CHAMBERLAIN replied: During the present year five cases of small-pox have occurred in the Hindley Urban District and four in the Aspull Urban District. The source of infection of the first case in each district has not been definitely ascertained. The usual steps are being taken in accordance with a memorandum issued by my department to prevent the spread of infection, and I am informed by the medical officer of Hindley that patients were removed to hospital; house and clothing disinfected and contacts vaccinated or re-vaccinated. Handbills were prepared and distributed to every house in the district and large notices warning the public of the outbreak and advising vaccination were posted in conspicuous positions throughout the district. The infant welfare clinic was opened as a vaccination centre where the vaccination officer was in attendance daily.

All schools were visited and special arrangements made for vaccination or revaccination. Over 1000 men, women, and children were treated in this short period. All efforts were centred on prevention. Absentees from works and schools were reported to the health department daily and visited. The kinema proprietors coöperated and the halls were closed for matinée performances. The schools, billiard halls, unemployment exchange, and the post office were also disinfected and preventive measures taken wherever considered necessary.

Small-pox and Vaccination.

Mr. GROVES asked the Minister of Health how many of the 7956 cases of small-pox classified in the report of the chief medical officer of the Ministry of Health for the year 1926 as unvaccinated had been vaccinated during the incubation period of small-pox, and the ages of such patients.—Mr. CHAMBERLAIN replied: Of the 7956 cases classified as unvaccinated in the report referred to 459 were persons unvaccinated at the time of infection, but vaccinated during the incubation period. The following is in reply to the last part of the question: The ages of the patients were:—

Under 1 year	15	20 and under 50 years..	64
1 and under 6 years ..	80	50 and over	8
6 ,, 11 ,, ..	111		
11 ,, 20 ,, ..	181	Total	459

Poor-law Medical Treatment.

Mr. WHITELEY asked the Minister of Health what was the cost per head per week of adult persons under medical treatment in institutions belonging to boards of guardians in England and Wales during the years 1925, 1926, and 1927 respectively.—Mr. CHAMBERLAIN replied: The average weekly cost per inmate in poor-law institutions in England and Wales for persons suffering from disease of body or mind, for which separate accounts are kept (other than institutions belonging to the managers of the Metropolitan Asylums District) was 43*s.* in the year ended March 31st, 1925, and 42*s.* 6¾*d.* in the year ended March 31st, 1926. The corresponding figure for the year ended March 31st, 1927, is not yet available, nor are figures distinguishing the cost of adult persons from that of children.

Hospital Beds for Tall Patients.

Mr. DAY asked the Minister of Health whether his attention had been called to the remarks made by the deputy coroner at an inquest held on Ernest Seldon Smith at Chelsea in which it was proved that on account of the deceased's height, which was 6 ft. 7 in., there was not a bed long enough for him in the hospital; and would he give the necessary instructions that at all hospitals under his control there shall be one extra long bed for such tall patients.—Mr. CHAMBERLAIN replied: I understand that the committee of the hospital have been asked to consider the question of providing for this kind of emergency. I do not think, however, that the matter is one in which I could properly issue any general instruction.

Tuberculosis in the Air Force.

Mr. HORE-BELISHA asked the Secretary of State for Air the number of men discharged from the Royal Air Force in 1927 suffering from tuberculosis; and in how many cases was the disability attributable to service and disablement pension awarded.—Sir S. HOARE replied: The numbers asked for are 23 and 4 respectively; in addition to the latter two cases are still under consideration.

MONDAY, FEB. 27TH.

Inspection of Offices.

Lieut.-Colonel FREMANTLE asked the Minister of Health if any advice was given by his department to local authorities as to their powers in the inspection of offices; and whether his attention had been called to any difficulties placed in the way of local authorities in making inspection.—Mr. CHAMBERLAIN replied: I advise local authorities, on inquiry, that they have powers to undertake systematic inspection of offices as well as inspection on complaint. I have not had any instance brought to my notice where a local authority has been impeded in such inspection. I may add that few specific complaints have been brought to my notice of office conditions.

Small-pox in England and Wales.

Mr. GROVES asked the Minister of Health the number of cases of small-pox in England and Wales for each quarter of the past year.—Mr. CHAMBERLAIN replied: The following statement gives the notifications of small-pox in England and Wales, 1927 (provisional figures):—

13 weeks ended April 2nd	6,153
,, July 2nd	3,753
,, Oct. 1st	1,930
,, Dec. 31st	2,928
	14,764

Treatment of Leprosy in the Empire.

Mr. DAY asked the Secretary of State for the Colonies if any new stations were being built within the Empire for the treatment of leprosy by the hydnocarpus oil remedy and whether he could make a full statement on this subject.—Mr. AMERY replied: In those parts of the Empire where leprosy exists active measures are being taken by medical departments for its control, in many cases in coöperation with the British Empire Leprosy Relief Association and other agencies. Medical officers trained in recent methods have been detailed for special duty in Nigeria, the Gold Coast, Fiji, and other colonies, while in all areas attention is being given to the possibility of the eradication of the disease, by the establishment of treatment stations, as in Tanganyika, Nyasaland, Uganda, or by such other means as the situation appears to demand.

Alcohol and Drug Revenue in India.

Mr. WELLOCK asked the Under Secretary of State for India what was the amount of revenue derived from the sale of alcohol and narcotic drugs in the provincial legislatures of India and what percentage of the total provincial taxation this constituted in each of the last five years.—Earl WINTERTON replied: the following is the information asked for:—

(1) —	(2) Revenue from excise.	(3) Total revenue from provincial taxation, including land revenue.	(4) Percentage of Column (2) to Column (3).
	Rs. Lakhs.	Rs. Lakhs.	
1921–22 ..	1650.3	6177.0	26·72
1922–23 ..	1790.9	6588.0	27·18
1923–24 ..	1872.5	6715.7	27·88
1924–25 ..	1885.5	6880.9	27·40
1925–26 ..	1930.8	6964.0	27·73

TUESDAY, FEB. 28TH.

Coördination of Service Hospitals.

Dr. VERNON DAVIES asked the Secretary of State for War what progress, if any, had been made during the last three years with regard to the coördination of military hospitals at home and abroad with Naval and Air Force Hospitals respectively.—Sir L. WORTHINGTON-EVANS replied: In 1922 the Military Hospital, Chatham, and the Royal Naval Hospital, Gibraltar, were closed. Military patients at Chatham are now treated in the Royal Naval Hospital, Chatham, and naval sick at Gibraltar are treated in the Military Hospital, Gibraltar. Since 1922 the Alexandra Military Hospital at Cosham and the Military Hospital at Devonport have been closed, and military patients in these districts are now treated at naval hospitals. The Joint Medical Services Committee has the question of coöperation between the three medical services continually under review and useful work is being done.

B.B.C. and Medical Practitioners.

Mr. MACQUISTEN asked the Postmaster-General whether the British Broadcasting Corporation was authorised to exercise discrimination between representatives of the medical profession and other practitioners who did not belong to that profession.—Sir W. MITCHELL-THOMSON replied: The British Broadcasting Corporation is entirely responsible for the selection of the persons engaged to broadcast talks or lectures, and I do not propose to interfere with the Corporation's discretion in this matter.

Mr. MACQUISTEN asked if the Postmaster-General was aware that the B.B.C. asked a distinguished osteopath to give a talk. He sent the talk for revision, but they sent it back to have cut out of it all reference to osteopathy. Later, they wrote that, because he was not a doctor—which they had known all along—they would not allow him to give the talk. Would the right hon. gentleman take some authority to prevent such incidents happening again?—Sir W. MITCHELL-THOMSON: I am not officially aware of any of these matters, and I do not propose to interfere with the discretion of the Corporation.

Mr. MACQUISTEN: But I wish you to interfere with their indiscretion.

Small-pox.

Dr. VERNON DAVIES asked the Minister of Health if he would give the small-pox statistics for 1927 in England and Wales, and the number of cases of small-pox for the latest date available.—Sir KINGSLEY WOOD replied: 14,764 cases of small-pox were notified in England and Wales during 1927, and there were 49 deaths in respect of which small-pox was entered on the medical certificate as the cause, or one of the causes, of death. 2582 cases have been notified during the first seven weeks of the present year, but no particulars as to deaths are yet available.

Obituary.

SIR DAWSON WILLIAMS, M.D., F.R.C.P. LOND.,

LATE EDITOR OF THE "BRITISH MEDICAL JOURNAL."

WE deeply regret to announce the death of Sir Dawson Williams which took place at his country house, near Bourne End, on Monday last, Feb. 27th, in the seventy-fourth year of his age. He had for some time been in a precarious state of health, but when at the beginning of the year, he resigned the editorship of the *British Medical Journal*, which he had held for 30 years, it was hoped that freedom from arduous daily work would bring a recovery of strength and enable him to enjoy some years of leisure. His death, however, was sudden and occurred from cardiac failure only a few days after his definite removal from London.

Dawson Williams was born in July, 1854, at Ulleskelf, near York, being the eldest son of the Rev. J. Mack Williams, the rector of Burnby, by his wife Ellen, the daughter of Nicholas Monsarrat. He received his early education at Pocklington School, matriculated at University College, London, went later to the medical school of University College Hospital, and graduated M.B., B.S. Lond. with the gold medal for medicine in 1879. He had already taken the M.A. degree, and two years later he proceeded to the M.D. degree, qualifying for the gold medal in medicine. He took the M.R.C.P. Lond. in 1885 and was elected F.R.C.P. in 1895. At University College Hospital he served as house physician, obstetric assistant, and ophthalmological assistant under such distinguished leaders as William Jenner, Russell Reynolds, Charlton Bastian, Sydney Ringer, Grailly Hewitt, and William Gowers, and Victor Horsley was his immediate contemporary.

Williams's early inclinations towards consulting practice, where he would certainly have won a distinguished place, were marked by a close interest in clinical pathology and especially in the diseases of childhood. After serving as house physician to the Brompton Hospital for Consumption he became registrar and pathologist at the Victoria Hospital for Children, and in 1885 was elected assistant physician to the East London Hospital for Children. During this period he made many contributions to the Transactions of the old Pathological Society, notably one on myosarcoma of the kidney, one on certain aspects of the ætiology of tuberculosis, and one on congenital hydronephrosis, while in 1898 he published his excellent manual "The Medical Diseases of Infancy and Childhood." This volume embodied his experiences at the Shadwell Hospital, and while indicating his own views very distinctly gave adequate space to the teaching of others on points of pathology and treatment, explaining where he was not fully in accord with them. The section dealing with the acute specific fevers and the chapter on diphtheria were recognised at once as excellently concise accounts, and Williams continued successfully his literary work in this direction by contributing to Allbutt and Rolleston's "System of Medicine" the articles upon measles, German measles, infectious coryza, and glandular fever. All these contributions presented the same features of accuracy and the same desire to present fairly opposing views, while their practical nature was indicated by the space devoted to the details of the treatment. There is no doubt that the man who could thus use his opportunities and summarise his own experiences and those of others would have been a successful and probably a great clinician.

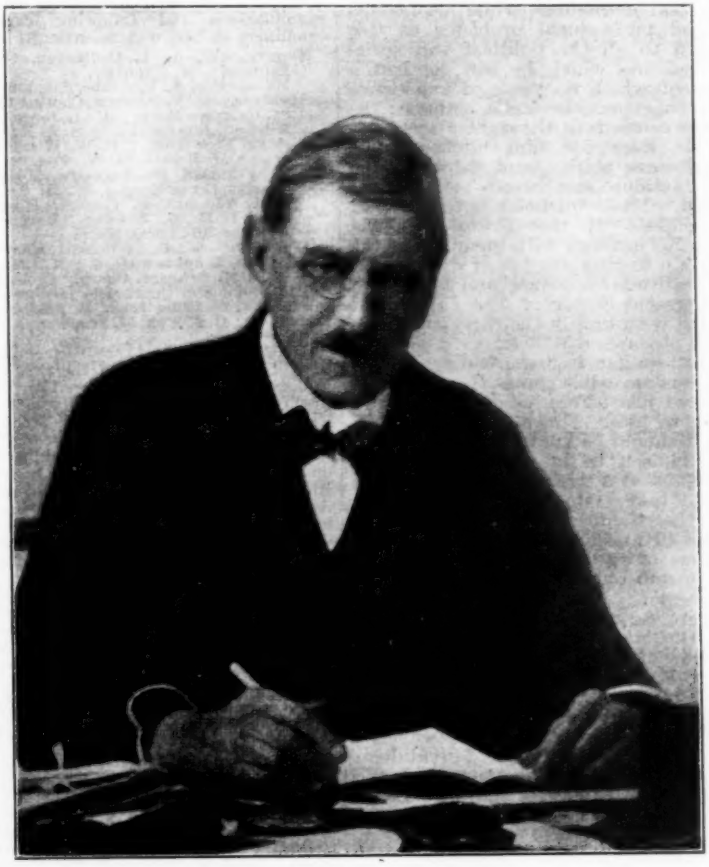
But he elected for journalism. As far back as 1881 he became associated with the editorial staff of the *British Medical Journal*, then edited by Mr. Ernest Hart. This connexion, at first desultory, became more and more intimate, until he became assistant editor in everything but name, his colleague being Louis Taylor, a capable journalist and a learned man who never finished his medical curriculum, but who, by a coincidence, started his course by dissecting a limb in company with his fellow-student, Williams. In 1895 Williams became assistant editor, and on the death of Mr. Ernest Hart in 1898 he was elected editor. Of that brilliant and singular personality, Ernest Hart, Williams always spoke warmly, describing him as one of the most sheerly clever men he had ever met, and an admirable tutor to a junior in journalism; while Hart soon learned to depend largely on an assistant owning so many qualifications which he did not himself possess. During the latter part of Williams's tenure of the junior position he was in practical charge of the journal, for Hart was a seriously sick man, and during this period the relations between the *British Medical Journal* and *The Lancet*, which had been rendered difficult by the personal differences between Ernest Hart and the Wakleys, became cordial—a spirit of professional coöperation being introduced which affected no honourable competition.

From this time forward Williams's life is reflected in the pages of the journal which he conducted with such conspicuous success and often in circumstances of great difficulty. He saw alike the effects of the remarkable advances in medical science which followed hard upon Lister's work and were manifested in every direction of pathological research. He saw the no less complete changes which occurred in the whole conduct of practice through the working of the National Insurance Act. And in the meantime the constitution of the British Medical Association was entirely altered as the result of progressively democratic modifications; and the membership increased remarkably when the elaborate pattern for the transaction of its affairs got into working order. But for a prolonged period the task of the editor, called upon to adjust new principles with old, to advise as to future procedure in untried circumstances, and to register what was happening from day to day, while contrary views were often held with equal honesty by opposing parties in the constituency, was one that called for just those qualities of unusual strength of mind and unfaltering fairness of outlook which Williams possessed.

Dr. C. O. Hawthorne, chairman of the Representative Body of the British Medical Association, sends the following estimate of Dawson Williams, as editor of the *Journal* of the Association and as leader or coöperator in its plans for advancement. Dr. Hawthorne writes: "Those of us who for a number of years have had close personal and official relations with Sir Dawson Williams have difficulty at this moment in expressing any thought other than the sense of loss which has so suddenly fallen on us. But a few weeks ago we said regretfully a formal farewell to an editor and a colleague, but we said it with the full hope that for him time had many restful hours in store and for ourselves opportunities for renewals of friendship and of counsel. And now, as it were in a moment, all these pleasing anticipations close in darkness and in some senses in dismay. For behind his apparent severity and aloofness Dawson Williams had for those who served with him a large capacity for comradeship, and qualities which stirred and held affection. Not readily known, perhaps, but well worth knowing, and genuine and real and sincere. One might differ from him in opinion, but no one questioned his integrity, and these personal qualities gave him the secure position which he held in the esteem and regard of his colleagues. With his resignation of the editorial chair there was a not unnatural conclusion that his work was done, but many of us who have been close to his stores of knowledge and experience and goodwill were counting with confidence on not a few helpful associations in the future. The editorship, indeed, had ceased, but not we knew well the friendship and the readiness for service. Now fate has put its seal on both chapters and left us but memories and regrets.

"In this brief note of appreciation I must recall general impressions rather than particular incidents. These come from associations, enterprises, and responsibilities shared in a common but not an equal

partnership. For with all his knowledge and experience Williams was always ready and indeed anxious, prior to decision and action, to hear the other view. He was, too, a good listener and patient of the other view, at least to a point, and he would take it from anyone so long as arguments could be quoted in its support. But beyond this moment the caller, apparently from some mysterious change in the atmosphere, became aware that the editorial time was valuable and that the last word had been said. In his own department he refused to be hurried in judgment, but he was not afraid of decision, and he preached and practised the doctrine of editorial responsibility in no uncertain fashion. Not unnaturally he took a high view of the function of the *British Medical Journal* in the scheme of the Association and, indeed, in the work of the profession generally, and against anything which tended to lessen this claim he was prepared to offer a strenuous resistance. Here, he would urge, is post-graduation training brought to the practitioner's door. Nor were his sympathies by any means restricted to the editorial chair. On the contrary, he was alert to all the interests and enterprises of the Association and was keen to hold these to the highest standards. In council he was helpful with information and a certain spaciousness of judgment, and though cautious he would press the bold view where his convictions were strong. Perhaps he accepted rather grimly an adverse decision, but he had a high sense of loyalty to the Association and happily he cultivated a generous measure of humour which bent rather to the ironic side. To be associated with him in the work of a great organisation was to learn with what abundance of knowledge and experience his mind was equipped, to grow an increasing regard for his high sense of personal and professional rectitude, and gradually to recognise that a great editor was none the less a man and a brother."



SIR DAWSON WILLIAMS.

Reproduced from a photograph taken in the editorial room of the "British Medical Journal" at the time of his retirement. (By the courtesy of the Editor of the "British Medical Journal.")

Mr. Bishop Harman, treasurer of the British Medical Association, draws a moving picture of his dead colleague and friend. He writes: "Dawson Williams was a great gentle man. The last two words are written apart, for they then seem the better to describe him than the more common joined word. He was a great gentle man. A man, great in stature both physical and mental. A man withal gentle of spirit. His gentleness was manifest behind all the natural mastery which his endowments enabled him to wield. That is my impression of him. It is the impression of a knowledge of some 30 years, reinforced in the last six years by as close a contact as work and social intercourse can give. For those last few years some common ground of work and responsibility in the affairs of the British Medical Association enabled me to learn of him more than all the earlier years of previous acquaintanceship. In the earlier days one knew him as the Editor of the *British Medical Journal*. One whose knowledge seemed almost omniscient in medicine. Withdrawn from the turmoil of research, of discussion, and of practice he seemed aloof, and yet one found him in touch with everyone. No matter how retired some earnest student might seem to others, Williams knew of him and his doings. In those days his word seemed all powerful. There was no recall from his decisions. But latterly we met as it were on a common level, a few around a table. Then his projects might be questioned, his decisions had to be defended. Then one saw how he worked. How carefully he gathered his facts, how he balanced seemingly conflicting observations, and by sheer logic disclosed the inevitable conclusion and the grounds for the action he advocated. For a man possessed of his singular mastery of affairs he was remarkably free from arbitrariness. This thing ought to be done, not because he said it ought to be done, but because he could show the reasonableness of the doing of it. If I were asked to say what I thought was the mainspring of Dawson Williams's work, I should reply without hesitation, love of his profession and—Duty. He loved his profession because it brought relief to sufferers, and he knew as few do what that means. But Duty filled his horizon, and there were no bounds to that; and to him it seemed there could be no praise higher than that duty had been done. When there was under consideration what motto would be appropriate for the 'Gates of Honour' that span the forecourt of the new House of the British Medical Association, and which were erected to the memory of those of our colleagues who had fallen in the Great War, Williams's first choice was 'Duty and Praise.' Though the choice fell upon other words, yet the force of his plea for his preference remains in my mind.

It seemed an epitome of his own work. Done often under severe physical handicap and in a life of much sorrow. Yet for him there was duty to be done. He did it. We can speak in his praise."

The words of Dr. Hawthorne and Mr. Bishop Harman need no endorsement; they reveal the man as he was known to those who really knew him. But it is fitting that *The Lancet* should record admiration and affection for the man, as well as our full appreciation of his qualities as an editor. Williams's academic equipment was from the beginning a source of strength in medical journalism, while his trained mind easily grasped professional problems *as they arose*. With regard to all the political and social development of medicine which he saw he had a clearness of judgment which no years of experience ever tempted him to express in facile manner; he was brave or he was cautious in the right places, and his high standards were for him unchangeable. Austerity and gentleness, ability, and fairness were expressed in his actions and words exactly as each was demanded. These qualities were reflected throughout his conduct of the *British Medical Journal* and also in his dealings with members of the medical profession, a countless number of whom must owe him a debt of gratitude for counsel and assistance. Among such is the present Editor of *The Lancet*, and he and all associated with him in the conduct of this paper feel the death of Dawson Williams as a personal loss. We trust that similar feelings, widely evoked in the medical profession, will express themselves in the movement started just before his death to create a tangible memorial to him. This movement will, of course, go on, and it should be known widely that Sir Dawson Williams himself in an interview shortly before his death expressed a wish with regard to the form that it should take. He desired nothing for himself, but hoped that the memorial would associate his name with some advancement of medicine. It is fitting that the name of so wise a champion of our calling should be remembered in connexion with some great and useful scheme.

Many honours were the natural lot of such a man. He was hon. LL.D. Glasg., D.Litt. Durham, D.Sc. Sheffield, and a Fellow of University College, London. He was created C.B.E. in 1919 and two years later received a knighthood. He married in 1882 Catherine, daughter of Robert Kirkpatrick-Howat, D.L. She died ten years ago, but a daughter survives who was her father's greatest care through many years of invalidism and to whom all hearts will go out in sympathy.

The funeral takes place to-day (Friday) at Little Marlow Cemetery, near Bourne End, at 3.30 P.M., while a memorial service will be held on Monday next, March 5th, at St. Pancras Church, at 1.45 P.M.

THE LATE DR. T. C. GUTHRIE.—Dr. Thomas Clement Guthrie, who died on Feb. 18th in his sixty-first year, had been in practice in Tunbridge Wells for 30 years, and was for a long time surgeon to the general hospital there. A grandson of the eminent divine, Thomas Guthrie, he was born at Liberton in Midlothian, and graduated at the University of Edinburgh in 1892. After house appointments at the Royal Infirmary, the Royal Hospital for Sick Children and elsewhere he entered practice at Tunbridge Wells at first in partnership and later by himself. He was a skilful surgeon whose work was much appreciated, and at the time of his death he had just retired from active practice. Dr. Guthrie leaves a widow with one son and one daughter.

THE LATE DR. J. W. KEIGHLEY.—Dr. John William Keighley, of Blackburn, who died on Feb. 15th, after a brief illness, was sixty-one years of age and was a native of Blackburn. He received his medical education at the University of Edinburgh and at the London Hospital, graduating as M.B. Edin. in 1894, and M.D. in 1918. A member of the Blackburn District Medical Society, he served as president for the session 1909–10, and he was also president of the Blackburn branch of the British Medical Association, and hon. secretary of the local medical and panel committee from its inception until three years ago. He took an active part in the public and political life of the town, and was a justice of the peace, an alderman of the borough, and a town councillor from 1907. He also served on the Lancashire Asylums Board for nine years. He leaves a widow, one daughter, and three sons.

Medical News.

UNIVERSITY OF OXFORD.—At a recent congregation the following degrees were conferred:—

D.M.—E. W. Neill Hobhouse, H. A. Gilkes, and D. S. Davies.
B.M.—R. Oddie.

Dr. A. Massey has been appointed honorary demonstrator in public health.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates satisfied the examiners in the undermentioned subjects:—

Surgery.—W. A. A. Collington, Guy's Hosp.; B. Elliott, Durham; M. Franzler, St. George's Hosp.; G. Furniss, Manchester, A. E. Gibbs, London Hosp.
Medicine.—G. N. Beeston, Charing Cross Hosp.; M. Franzler, St. George's Hosp.; H. I. Jones, St. Mary's Hosp.; J. R. Mitchell, Liverpool; N. S. J. Roberts (Sec. 1), Bristol and Royal Free Hosp.; R. W. Wood, St. Bartholomew's Hosp.
Forensic Medicine.—G. N. Fox, St. Bartholomew's Hosp.; M. Franzler, St. George's Hosp.; K. J. M. Graham, Charing Cross Hosp.; W. B. Hallums, St. Mary's Hosp.; H. J. Harcourt, St. Thomas's Hosp.; H. T. Ince, St. Mary's Hosp.; F. M. Lessing, Charing Cross Hosp.; H. T. Rylance, Middlesex Hosp.
Midwifery.—K. D. C. Beckitt, Charing Cross Hosp.; E. E. Bowen, Middlesex Hosp.; M. Franzler, St. George's Hosp.; K. J. M. Graham, Charing Cross Hosp.

The Diploma of the Society has been granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: G. N. Fox, M. Franzler, G. Furniss, and R. W. Wood.

UNIVERSITY OF LONDON.—At a meeting of the Senate held on Feb. 22nd the title of Fellow of University College, London, was conferred on Dr. Gleb Anrep, lecturer in physiology in the University of Cambridge, and Surgeon Vice-Admiral Arthur Gaskell, Medical Director-General of the Navy. The title of Fellow of King's College, London, was conferred on Mr. T. Franklin Sibly, D.Sc., principal officer of the University of London, and Prof. William Blair Bell, director of the Liverpool (Cancer) Research Association. Sir Holburt Waring was appointed to represent the University at the centenary celebrations of the Faculty of Medicine and International Congress of Tropical Medicine and Hygiene to be held at Cairo in December next.

University of London: Parliamentary Representation.—At the annual general meeting of the University of London Conservative and Unionist Association, held on Feb. 23rd, it was decided to adopt Sir John Gilbert as the prospective Conservative candidate at the next general election. He has been an alderman on the London County Council since 1910. He was chairman of the L.C.C. Education Committee, 1913–17; chairman of the L.C.C. itself, 1920–21, and chairman of the L.C.C. General Purposes Committee, 1921–27. He has been a member of the Senate of the University since 1921, and served on the Board of Education Departmental Committee on the Training of Teachers, 1923.

ROYAL INSTITUTION.—A meeting will be held to-day, Friday, March 2nd, at 9 P.M., at 21, Albemarle-street, London, W., when Sir Farquhar Buzzard, Regius professor of medicine in the University of Oxford, will speak on the Psychology of the Sick.

A TOUR IN YUGOSLAVIA.—A medical tour has been planned to take place at Easter through Yugoslavia, the huge and interesting territory which now represents the whole of the Balkan area west of Roumania and Bulgaria, with contributions from Austria and Hungary. The tour will include the ancient capital of Zagreb; Sarajevo, the little city where the storm burst which involved Europe in war; Mostar, the capital of Herzegovina; Cetinje, the former site of Montenegro rule; the lake of Scutari, and Ragusa, perhaps the best known for its beauty of all the Dalmatian cities. The journey will also include Spalato, now known as Split, a town largely contained by a vast palace of Diocletian; Sebenico, which has a fifteenth century cathedral with unique architectural features; and Zara, whose notable churches and Roman remains always attract the visitor of the Adriatic coast. The tour commences on Tuesday, April 3rd, when a departure will be made from Liverpool-street Station for Harwich, at 8.30 P.M. Early arrival at the Hook of Holland will allow the travellers to dine at Munich on April 4th and in Zagreb on April 5th. The next three weeks will be spent in somewhat leisurely travel, by train and car, and occasionally by boat, through the centres which have already been mentioned, and the schedule suggests arrival back at Harwich early on the morning of April 24th, Liverpool-street Station being reached by midday. Full information as to expenses, kit, and details of the tour can be obtained from Mr. Henry Baerlein at the Bath Club, 34, Dover-street, London, W.1.

HARVEIAN SOCIETY OF LONDON.—A meeting of this Society will be held on Thursday, March 15th, at 8.30 P.M., at the Paddington Town Hall, when the Harveian Lecture will be delivered by Sir William Willcox, his subject being Toxicology and its Application to Medical Practice.

COURSE IN PSYCHOLOGICAL MEDICINE.— A course of lectures and practical instruction for candidates for the diploma in psychological medicine will begin at the Maudsley Hospital, Denmark Hill, London, S.E., from March 6th. Inquiries should be addressed to the director of the Central Pathological Laboratory at the hospital.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—A meeting of this society will be held at the Miller General Hospital, Greenwich, on Friday, March 9th, at 8.45 P.M., when Dr. Maud M. Chadburn will give an address on the Radium Treatment of Cancer of the Cervix Uteri.

MANCHESTER ROYAL INFIRMARY.—The trustees of the late Colonel John Barlow, of Bury, have assigned £5000 to the new Nurses' Home Fund of Manchester Royal Infirmary.

UNIVERSITY OF BIRMINGHAM.—A block of land comprising over 40 acres has been presented to the University by Mr. and Mrs. Anstruther-Gough-Calthorpe. It lies in the immediate vicinity of the present buildings and brings the total area owned by the University up to 100 acres.

UNIVERSITY OF EDINBURGH.—Dr. W. T. Ritchie, senior lecturer in clinical medicine, has been appointed to the professorship in medicine in the University vacant by the resignation of Prof. Lovell Gulland.

CLINICAL STUDY OF RHEUMATISM.—The Central Committee on Rheumatism, International Society of Medical Hydrology, have decided to organise clinical conferences on cases of rheumatic disease in hospitals. In connexion with the inaugural meeting of the Society's French Committee on Rheumatism in Paris on April 2nd a conference will take place at La Pitié Hospital and the Salpêtrière. Further information may be had from the Secretary of the French Committee, Dr. H. Forestier, 10 rue du Mont Thabor, Paris (I).

INTERNATIONAL COURSE AT CARLSBAD.—An international medical post-graduate course, having special reference to balneology, will be held at Carlsbad from Sept. 23rd to 29th. Representatives of the medical faculties of Austria, Bulgaria, Czecho-Slovakia, Denmark, France, England, Germany, Italy, Norway, Poland, Sweden, Switzerland, and the United States of America will give addresses, and further information may be had from Dr. Edgar Ganz, Haus "Pelikan," Alte Wiese, Carlsbad, Czecho-Slovakia.

LECTURES ON CANCER.—The Yorkshire Council of the British Empire Cancer Campaign, in conjunction with the Leeds and West Riding Medico-Chirurgical Society, has arranged a series of three lectures, open to members of the medical profession without fee, to be given at the Medical School, Leeds, on Wednesdays, at 3.30 P.M. On March 7th an introductory address will be given by Sir Berkeley Moynihan; on April 4th Prof. G. E. Gask will speak on Radium in the Treatment of Malignant Disease; and on May 9th Prof. G. Grey Turner will speak on Cancer of the Rectum. Tea will be provided at 4.30 P.M., and practitioners who intend to be present are asked to inform the secretary of the campaign at 47, Park-square, Leeds, at least two days before each lecture.

SIR CHARLES HASTINGS MEMORIAL LECTURE.—The second of a series of popular health lectures commemorating Sir Charles Hastings will be given under the auspices of the British Medical Association on Wednesday, March 21st, by Sir George Newman, Chief Medical Officer of the Ministry of Health and the Board of Education. His subject will be the Fundamentals of Health. Lord Cozens-Hardy will take the chair at 8 P.M. and admission will be free by tickets obtainable from the financial secretary of the B.M.A. at the Association's House in Tavistock-square, London, W.C. 1, where the lecture will be delivered.

ROYAL SOCIETY OF EDINBURGH.—The following candidates, among others, have been recommended by the Council for election as Fellows of this Society: Dr. A. J. Clark, professor of materia medica, and Mr. John Fraser, Regius professor of clinical surgery, in the University of Edinburgh; Dr. Kenneth Fraser, deputy medical officer of health for Cumberland; Mr. P. J. Johnston-Saint, secretary of the Wellcome Historical Medical Museum, London; Dr. R. W. Johnstone, professor of midwifery and diseases of women in the University of Edinburgh; Dr. T. J. Jones, lecturer in anatomy in the University of Liverpool; Dr. T. J. Mackie, professor of bacteriology in the University of Edinburgh; Dr. G. H. Percival, assistant physician in the skin department of the Edinburgh Royal Infirmary; and Mr. Ronald Senior-White, malaria research officer, Central Malaria Research Bureau, Kasauli, India.

DR. SCHWEITZER'S ENGLISH VISIT.—It is stated that Dr. Albert Schweitzer, who has returned to Europe from his hospital at Lambarene in French Equatorial Africa, will arrive in England at the beginning of May for a six week's visit. It is doubtful whether he can arrange lectures in this country, but invitations to give organ recitals will be considered if sent to Mr. J. P. Fletcher at Friends House, Euston-road, London, N.W. 1.

SEAHAM HALL AS SANATORIUM.—On Saturday last Seaham Hall was opened as a sanatorium for the county of Durham. This beautifully situated and historic house has been presented to the County Council by the Marquis of Londonderry, by whose family it was purchased in 1824.

FINANCES OF KING'S COLLEGE HOSPITAL.—Correcting an impression that has got abroad that this hospital is financially prosperous, Prof. W. P. Halliday, Principal of King's College, when presiding over the annual court, stated that there is an outstanding debt of £72,000. There has been, however, on the past year's working a credit balance of £5700; the income just exceeded £100,000.

BETHLEM HOSPITAL.—At a meeting of the Governors held on Feb. 26th the Lord Mayor announced that Sir Charles Wakefield had given £25,000 towards the appeal for £120,000 still required to cover the estimated cost of the new hospital building. Other gifts included £5000 from Lady Cooper. A rural site has been secured for the hospital at the Monks Orchard Estate, Shirley, near Croydon, with a total area of 330 acres.

THE PRACTISING MIDWIFE.—A conference on the place of the practising midwife in relation to the protection of motherhood will be held on Wednesday, March 7th, at 5 P.M., under the auspices of the Midwives' Institute, at the house of the Royal Society of Arts, John-street, Adelphi, W.C. The conference is based upon the report by Dame Janet Campbell to the Ministry of Health, and will be presided over by Sir Francis Champneys. The discussion will be opened by Dr. J. S. Fairbairn.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, March 6th.—8.30 P.M., ORTHOPÆDICS. Discussion on the Treatment of Acute Osteomyelitis. Opener: Mr. Harry Platt. Other Speakers: Mr. Alexander Mitchell, Mr. Eric Lloyd, Mr. Whitchurch Howell, and Mr. W. H. Ogilvie. 8 for 8.30 P.M., PATHOLOGY. Laboratory Meeting at the Lister Institute, Chelsea Gardens, S.W. 1. Papers and Demonstrations: G. H. Eagles and D. McClean: On the Growth of Vaccinia in Tissue Culture. R. W. Fairbrother: Cholera Antigens from the Prophylactic Point of View. J. H. Orr and W. A. Campbell: The Action of *Welchii* Toxin on Red Cells in vitro. M. Robertson: The Behaviour of a Protozoon Exposed to Acriflavine. J. C. G. Ledingham and D. McClean: Propagation of Vaccine Virus in Rabbit Dermis. H. Chick, M. H. Roscoe and M. A. Boas: Pellagra-like Conditions in Rats. (Demonstration.)

WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. Papers: Dr. Robert Hutchison: A Biographical Note on Sir James Wylie, Bart., M.D., A Medical Adventurer. Mr. F. Prescott: Louis Pasteur and Fermentation. 8.30 P.M., SURGERY. Discussion on Colectomy. Opener: Dr. T. de Martel (Paris).

THURSDAY.—5 P.M., BALNEOLOGY. Discussion on the Value of Marine Health Resorts, with a Special Reference to Children. Opener: Dr. Fortescue Fox. Subsequent Speakers: Dr. Percy Lewis (Folkestone), Dr. W. C. Willoughby (Eastbourne), Dr. Collis Hallowes (Torquay), Dr. G. R. Bruce (Hastings), Dr. W. S. Campbell (Sidmouth), Dr. W. G. Sutcliffe (Margate), Dr. Octavia Wilberforce (Brighton). 8.30 P.M., NEUROLOGY. Discussion on Narcolepsy. Opener: Dr. S. A. Kinnier Wilson.

FRIDAY.—5.30 P.M., CLINICAL. (Cases at 5 P.M.) Cases will be shown. 5 P.M., OPHTHALMOLOGY. Clinical Meeting at St. Thomas's Hospital. (Tea at 4.30 P.M.) Cases: P. G. Doyne: 1. Asymmetry of Face. ?Plagiocephaly. 2. ?Parinaud's Conjunctivitis. 3. Atypical Ptosis. Arthur D. Griffith: 1. A Case of Scarring of the Nerve-head (probably birth injury). 2. Hypertrophic Scars in Retina. Fundus Paintings: 1. Scarring of the Nerve-head (see above). 2. Retinal Hole at the Macula. 3. Gumma of Sclera. 4. Gummatous Scleritis. G. W. Kendall: Loss of Upper Half of Visual Field in One Eye. ? Cause. A. S. MacCallan: Tumour of the Iris. H. Neame: ? Familial Macular Degeneration in a Girl. A. Hugh Thompson: 1. Aniridia with Dislocated Lens. 2. Macular "Colobomata." 3. Acquired Central Choroiditis simulating a Second Optic Disc.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.
WEDNESDAY, March 7th.—9 P.M., Dr. F. J. Poynton: Rheumatic Heart Disease in Childhood. (Lettsomian lectures (3).)
THURSDAY.—7.45 P.M., Anniversary Dinner at the Trocadero Restaurant.

LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY POST-GRADUATE COURSE ON CANCER.
WEDNESDAY, March 7th.—3.30 P.M. (in the Medical School, Leeds), Sir Berkeley Moynihan, P.R.C.S.: Introductory Address.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, March 6th.—5 P.M., Dr. F. A. E. Crew: Individual, Familial, and Racial Inborn Differences in Respect of Immunities and Disease Resistance. (Milroy lecture (2).)
THURSDAY.—5 P.M., Milroy lecture (3).)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, March 5th, to SATURDAY, March 10th.—FELLOWSHIP OF MEDICINE LECTURE, Medical Society of London, 11, Chandos-street, Cavendish-square, W. Mon., 5 P.M., Dr. C. M. Wilson: The Chronic Abdomen.—BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck-street, W. Tues., 3 P.M., Dr. F. Hernaman-Johnson: X Rays as an Aid in the Diagnosis of Abdominal Disease (Demonstration of Radiographs).—HOSPITAL FOR DISEASES OF THE THROAT, Golden-square, W., Wed., 3 P.M., Clinical Demonstration by Mr. Jefferson Faulder. The above open free to members of the medical profession.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Special Course in Gynæcology—some mornings and some afternoons.—QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, E. Intensive Course in Diseases of Children.—ROYAL EYE HOSPITAL, Southwark, S.E. Demonstrations and Treatment of Diseases of the Eye at 3 P.M., Mon. to Fri. inclusive.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith.
MONDAY, March 5th.—10 A.M., Dr. Dowling: Skin Department. 2 P.M., Dr. Trevor Davies: Gynæcological Department. 4.30 P.M., Special Lecture; Mr. Addison: Cancer of the Tongue.
TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Hamblen Thomas: Throat, Nose and Ear Department.
WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Mr. Simmonds: Surgical Out-patients. 3 P.M., Sir Henry Simson: Gynæcological Ward.
FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 12 noon, Dr. Ironside: Clinical Demonstration. 4.30 P.M., Mr. Vlasto (Special Lecture): Diagnosis and Treatment of Middle Ear Infections.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.
Daily, 10 A.M., to 5 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments. Anæsthetic and Operative Surgery Classes.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.
WEDNESDAY, March 7th.—4 P.M., Dr. C. G. Lakin: The Medical Dyspepsias.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham.
MONDAY, March 5th.—2.30 to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Throat, Nose and Ear Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, and Ear, Nose, and Throat Clinics. Operations.
FRIDAY.—10.30 A.M., Throat, Nose, and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.
On Wednesday and Friday, at 2.30 P.M., there will also be demonstrations of Skin and Medical (Children) Cases by Dr. W. Jenkins Oliver and Dr. C. E. Sundell respectively.

NATIONAL HOSPITAL, Queen-square, Bloomsbury.
MONDAY, March 5th.—2 P.M., Dr. Hinds Howell: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: The Epilepsies.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Bernard Hart: The Psychoneuroses (2).
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Mr. Just: Methods of Testing the Eighth Nerve (in Out-patient Department).
FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Symonds: Some Forms of Encephalitis.

HOSPITAL FOR SICK CHILDREN, Great Ormond-st., W.C.
THURSDAY, March 8th.—4 P.M., Mr. H. Tyrrell Gray: Abdominal Pain.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, March 6th.—3.15 P.M. (at the Royal Chest Hospital), Dr. H. Barty King: Demonstration of Cases in the Wards.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, March 6th.—5 P.M., Dr. J. E. M. Wigley: Leukæmia Cutis. Mycosis Fungoides.
THURSDAY.—5 P.M., Dr. J. E. M. Wigley: Pemphigus and Allied Eruptions.

BELGRAVE HOSPITAL FOR CHILDREN, 1, Clapham-road, S.W.
WEDNESDAY, March 7th.—4.30 P.M., Mr. R. A. Ramsay: Clinical meeting.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, March 9th.—4 P.M., Mr. Arthur Brown: Diseases of the Maxillary Antrum.

ST. PAUL'S HOSPITAL, Endell-street, W.C.
THURSDAY, March 8th.—4.30 P.M., Mr. H. P. Winsbury White: Stone in the Upper Urinary Tract and its Treatment.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, March 7th.—4.30 P.M., Dr. G. Roche Lynch: Some Problems in Medico-Legal Practice.

PEOPLE'S LEAGUE OF HEALTH.
WEDNESDAY, March 7th.—6 P.M. (at the Medical Society's Rooms, 11, Chandos-street, Cavendish-square, W.), Dr. W. A. Potts: Crime and Delinquency.
THURSDAY.—6 P.M., Prof. Winifred Cullis: Food in Relation to Growth.

ANCOATS HOSPITAL POST-GRADUATE LECTURES, Mill-street, Manchester.
THURSDAY, March 8th.—4.15 P.M., Dr. Langley. Exophthalmic Goitre.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, March 6th.—4.15 P.M., Mr. J. Howson Ray: Mucous Colitis.
FRIDAY.—4.15 P.M., Dr. D. E. Core: Demonstration of Medical Cases.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
FRIDAY, March 9th.—3.30 P.M., Mr. Finch: Surgical Cases.

Appointments.

GEMMELL, R. W., M.D., Ch.B. Liverp., D.P.H., has been appointed Hon. Radiologist, Stanley Hospital, Liverpool.
OWEN, R. D., F.R.C.S. Edin., Honorary Assistant Surgeon to the Ear, Nose and Throat Department of the Cardiff Royal Infirmary.
RICHARDSON, G. Y., M.D., Ch.B. Edin., D.P.H., Medical Officer to the counties of Midlothian, West Lothian, and Peebles.
WILLIAMS, R. L., M.B., B.Ch. Camb., F.R.C.S. Eng., Honorary Surgeon to the Passmore Edwards Hospital, Wood Green, London.
St. Bartholomew's Hospital: WILSON, H., F.R.C.S. Eng., M.S. Lond., Surgeon; KEYNES, GEOFFREY, M.D. Camb., F.R.C.S. Eng., Assistant Surgeon.
Certifying Surgeons under the Factory and Workshop Acts: THOMAS, I., M.B., Ch.B. Liverp. (Pontrhydygroes, Cardigan); HENDERSON, P. S., M.B., Ch.B. Edin. (Fyvie, Aberdeen); CARTER, C. S. (Kenninghall, Norfolk).

Vacancies.

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.
Birmingham and Midland Ear and Throat Hospital.—Second H.S. At rate of £150.
Birmingham and Midland Homœopathic Hospital and Dispensary.—Hon Anæsthetist and Hon. Consulting Ophth. S.
Birmingham, Monyhull Colony, King's Heath.—Res. Asst. M.O. £250–£350.
Brighton Borough Infectious Disease Hospital and Sanatorium.—Res. M.O. £350.
Brighton, Sussex Maternity and Women's Hospital.—Res. H.S. £130.
Carlisle, Cumberland Infirmary.—Two Res. M.O.'s. At rate of £155 and £135 respectively.
Chesterfield and North Derbyshire Royal Hospital.—Jun. H.S. and Cas. H.S. Each at rate of £100.
Douglas, Isle of Man, Noble's Hospital.—Res. H.S. £175.
Dreadnought Hospital, Greenwich.—H.P. At rate of £110.
Hertford County Hospital.—Hon. Anæsthetists.
Hertfordshire County Council.—Asst. M.O.H. £700.
Hospital for Sick Children, Great Ormond-street, W.C.—Jun. Cas. O. (part-time). At rate of £75.
Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—H.P. At rate of £135.

King's College Hospital, Denmark-hill, S.E.—Sambrooke Medical Reg. £175. Also Two Jun. Surgeons.
Leamington Spa, Warneford General Hospital.—Res. H.S. £165.
Liphook, Hants, King George's Sanatorium for Sailors.—Asst. M.O. At rate of £200.
Liverpool, Ministry of Pensions Hospital, Mossley Hill.—Jun. M.O. £300.
Liverpool Open-Air Hospital for Children, Leasowe.—Jun. M.O. £200.
Manchester, Ancoats Hospital.—Clin. Asst. to Ear, Nose, and Throat Dept. 10s. 6d. per clinic.
Manchester, Old Trafford, Royal Residential Schools for the Deaf.—M.O.
Manchester Royal Children's Hospital, Pendlebury.—Res. Surg. O. and Res. M.O. Each at rate of £125.
Manchester Royal Children's Hospital, Gartside-street.—Asst. M.O. At rate of £140.
Manchester, St. Mary's Hospitals, Whitworth-street.—Four H.S.'s, Each at rate of £50.
Middlesex Hospital, W.—Jun. Res. Asst. Anæsthetist. At rate of £80.
Miller General Hospital for South-East London, Greenwich-road, S.E.—Hon. P. to Special Dept. for Children. Also Res. M.O. At rate of £250. Also H.P. At rate of £125.
Newcastle-upon-Tyne, City and County of.—Asst. M.O.H. £750.
Northampton General Hospital.—H.P., two H.S.'s, and two Asst. H.S.'s. Each at rate of £150.
Nottingham General Hospital.—H.S. At rate of £150.
Notts County Mental Hospital, Radcliffe-on-Trent.—Med. Supt. At rate of £1000.
Preston and County of Lancaster Royal Infirmary.—H.P. £190.
Radcliffe-on-Trent, Notts County Mental Hospital.—Med. Supt. £1000.
Royal Dental Hospital of London, 32, Leicester-square, W.C.—House Anæsthetist.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Med. Reg.
St. Mary Abbots Hospital, Marloes-road, W.—Res. Med. Sec. and Reg. £300.
St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. At rate of £75.
Salford Royal Hospital.—Two H.S.'s. Each at rate of £125. Also Anæsthetist. £1 1s. per session.
Salisbury General Infirmary.—H.S. £150.
Southampton, Royal South Hants and Southampton Hospital.—Cas. O. £120.
West London Hospital, Hammersmith, W.—H.P. and two H.S.'s. Each at rate of £100. Hon. Med. Reg. £100. Also Hon. Anæsthetist.
Woolwich Infirmary, Plumstead High-street, S.E.—Consulting Nose, Ear, and Throat Specialist. £105.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Saltcoats (Ayrshire).

Births, Marriages, and Deaths.

BIRTHS.

ATTENBOROUGH.—On Feb. 25th, at Lismore, Camberley, the wife of Dr. Cuthbert Attenborough, of a son.
BOOBBYER.—On Feb. 25th, the wife of Dr. P. W. Boobbyer, of Warwick-road, Ealing, of a son.
BROWNE.—On Feb. 26th, at St. Katharine's Precinct, Regent's Park, N.W., the wife of Leonard Foster Browne, M.D., of a daughter.
DAVIS.—On Feb. 23rd, at Lower Berkeley-street, W., the wife of K. J. Acton Davis, M.Ch., F.R.C.S., of a daughter.
LEVY.—On Feb. 23rd, the wife of S. I. Levy, F.R.C.S., of Harley-street, W., and "Ruscombe," Ranulf-road, N.W., of a daughter.
MARTIN.—On Feb. 11th, at Piercefield Cottage, Park Village East, Regent's Park, N.W., the wife of E. Kenneth Martin, M.S., F.R.C.S., of a daughter.
MOORE.—On Feb. 21st, at Birkenhead, the wife of Dr. L. C. Moore, of a son.

MARRIAGES.

WILLIAMS—ANGELL.—On Feb. 21st, at Weybridge, Major A. Scott Williams, D.S.O., R.A.M.C. (Ret.), to Dorothy, daughter of the late Lewis Angell, M.Inst.C.E., F.R.I.B.A., of Eastbourne.

DEATHS.

ASKHAM.—On Feb. 14th, at Menton, Hugh Lowrie Askham, M.R.C.S., L.R.C.P., of Pershore, Worcestershire.
BURKE.—On Feb. 24th, at Hawthorne, Lansdown, Bath, Lieut.-Colonel W. H. Burke, late I.M.S., aged 69.
COCKROFT.—On Feb. 23rd, at Hazelwood, Lancaster, Mary, the beloved wife of George Cleminson Cockroft.
COWEN.—On Feb. 16th, at Oxford-terrace, W., Richard John Cowen, L.R.C.P.I.
POCOCK.—On Feb. 22nd, Alfred George Clarke Pocock, M.B., M.R.C.S., L.R.C.P., L.S.A.
SPENCE.—On Feb. 19th, at Edderston-road, Peebles, Thomas Fair Hetherington Spence, M.B., C.M.
UNDERHILL.—On Feb. 20th, suddenly, at Elm Bank-gardens, Barnes, Arthur Stopford Underhill, B.A., M.D., M.Ch., M.R.C.S., D.P.H., aged 78.
WILLIAMS.—On Feb. 27th, at Bourne End, Sir Dawson Williams, C.B.E., M.D., F.R.C.P., late Editor of the *British Medical Journal*, aged 73.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

CAPTAIN COOK'S DIETETIC SAGACITY.

Dr. R. T. Williamson, in the *Journal of the Royal Naval Medical Service* (January, 1928), draws attention once more to Captain Cook's special contribution to medical science in conducting his long second voyage without any outbreak of scurvy among the crew. He attributed his success entirely to his dietetic precautions, and he enumerates the special articles of food upon which he relied. These were "sweet-wort," given in large quantities as a preventive, "sour krout," a portable soup or broth, and a "rob" of oranges or lemons. He also made a point of taking on board fresh food wherever possible.

Needless to say, when an outbreak of scurvy occurred among Indian troops in Mesopotamia in the Great War, and Lister Institute workers were seeking for portable foods, suitable for victualling an army, their attention was directed to the experience of Captain Cook. They actually made use of the same natural process as he utilised, but in practice, malt, the principal constituent of the sweet wort, was of no use to them. V. Fürst [1] had shown that seeds, upon germination, develop the antiscorbutic principle and his work had been confirmed and extended at the Lister Institute,[2 3] and was made the basis of the principal recommendation. Without a doubt the virtue of Captain Cook's sweet wort must have been due to the anti-scorbutic vitamin, developed in the malt when the barley, of which it was composed, was germinated. But when A. Harden and S. S. Zilva [4] tested modern malt they found that it had no antiscorbutic potency. The explanation lies in the fact that modern malt is kilned, in which process the antiscorbutic vitamin, formed during germination, is again destroyed. Sour krout gave the war workers much thought. When prepared in the modern continental fashion, a process of fermentation is included in the method of preparation, and the cabbage might well retain its anti-scorbutic potency for a long time. For obvious reasons, however, sour krout could not be easily obtained and, as far as is known, is still untested. It would be interesting to know whether it deserves the reliance which Captain Cook placed upon it. Captain Cook's triumph over scurvy was a great victory for empirical knowledge and it is always interesting to look back upon such an achievement and try to interpret it by later exact knowledge. The present instance, however, shows how the inexactness or incompleteness of the record often makes this difficult.

"COMMON HELMINTHS IN MEDICAL PRACTICE." [5]

THIS frankly commercial pamphlet upon santonin contains a summary of present-day knowledge of the life-histories and pathological effects of the roundworm, whipworm, and threadworm, facts and opinions being selected from the literature, over 150 references to which are cited. If conclusions are sometimes drawn over-dogmatically, this in the circumstances could hardly be avoided. Next year will signalise the centenary of the extraction of santonin; that it is still with us is eloquent of its value. Mention is made of the evidence that santonin is not itself anthelmintic, but that in process of its absorption from and re-excretion into the bowel it becomes something which is so, thus falling into line with the action of quinine in malaria, of emetine in amœbic dysentery, and of other active parasiticides in other infections. These considerations suggest, first, that its mode of action is along right biological lines; and secondly, that it is upon such lines that we should look for an anthelmintic efficient against the hookworms. The practice advised conforms with what is known of its mode of action. Apart from idiosyncrasy the dose recommended is grs. 5 for a man, grs. 4 for a woman, grs. 2 to grs. 4 for an adolescent, gr. ¼ to grs. 2 for a child, and gr. ⅛ to gr. ½ for an infant. Against trichuris and enterobius (oxyuris) a small quantity of added calomel has a virtue by the flow of bile induced. The drug must be allowed ample time—12 hours—to act and presumably to be re-excreted; and must then be removed with the worms by a sharp purge of Epsom salts or castor oil. Helminthiasis of the kinds mentioned is sufficiently prevalent even in temperate countries to prevent the summary dismissal of its consideration.

[1] V. Fürst: Zeitsch. Hyg., 1912, lxxii., 121.
[2] H. Chick and E. M. Hume: Trans. Soc. Trop. Med. and Hyg., 1917, x., 141.
[3] H. Chick and E. M. Delf: Biochem. Jour., 1919, xiii., 199.
[4] A. Harden and S. S. Zilva: Ibid., 1924, xviii., 1129.
[5] Eastern and Russian Trading Co., Ltd., 26A, Finsbury square, E.C.

NEW PREPARATIONS.

WE have received from Messrs. Schering and Co., 3, Lloyd's-avenue, London, E.C., specimens of *Synthalin*, the synthetic preparation whose use is recommended in diabetes. There have appeared in THE LANCET during the last four or five months several authoritative pronouncements on synthalin in the treatment of diabetes, in the light of which the value of the claims made can be estimated. On Sept. 3rd the preliminary reports on this subject to the Medical Research Council were printed in full, and from these it will be seen that synthalin may replace insulin apparently satisfactorily, but only in certain cases. Broadly speaking, the two sides of the insulin action—the depression of new formation of glucose in the liver and the accelerated metabolism of glucose already present in the circulation—are claimed to be represented in the action of synthalin. The question of its practical use has to be decided by the degree to which its beneficial action is complicated by its toxic effects. Without regarding synthalin as an ideal insulin substitute it may be held to suggest hopes of further progress. All the conclusions yet arrived at are drawn from the consideration of a limited number of cases or of investigation extending over a brief period, and will be accepted with caution. Where there is a definite contra-indication of insulin the substitute may fairly be tried, and it is hoped that all medical men using the drug in this more or less empirical way will bear in mind possible toxic effects and keep careful records of their results to serve for future information. The employment of synthalin as a substitute for insulin in Germany appears to be based on evidence derived largely from animal experiments.

We referred in our columns recently (THE LANCET, Jan. 14th and 28th) to a new synthetic remedy entitled *Plasmoquine*, mentioning that, although it was introduced by Prof. Mühlens, of Hamburg, and Prof. Sioli, of Düsseldorf, under the name of plasmochin, and is still issued under that name, it has been registered by the Bayer Products, Ltd. (19, St. Dunstan's Hill, London, E.C.) as plasmoquine. Chemically it is an alkyl-amino-β-methoxy-quinoline salt and is a new synthetic derivative of the quinoline ring. It occurs as a tasteless, light yellow, finely granular powder, freely soluble in alcohol, and only sparingly soluble in water. The action of the acid gastric juice converts it into the freely soluble hydrochloride. Clinically, it has been under trial in cases of plasmodium infection since the autumn of 1925 and satisfactory results are reported in tertian and quartan malaria, and in blackwater fever. In subtertian (æstivo-autumnal) type plasmoquine was found to be more effective combined with quinine than without. The preparation, as now submitted to us by Messrs. Bayer, is made up in tablet form combined with quinine. Each tablet contains 0·005 g. (gr. 1/12) plasmoquine and 0·0625 g. (gr. 1) quinine sulphate. The reason for believing that the addition of quinine renders the plasmoquine distinctly more efficacious in the subtertian variety of malaria, and may therefore render it preferable for prophylactic purposes in undifferentiated cases, may be found in the observations on the effects of plasmochin and "plasmochin compound" on the gametocytes of benign tertian and subtertian malaria, made by Dr. Manson-Bahr in THE LANCET for Jan. 7th, p. 26.

HOSPITALS AND CHARITIES YEAR-BOOK.

AN interesting feature of the latest edition [1] of "Burdett" is a table showing in detail the progress of the Hospital Saturday Fund since 1898, the year in which the street collections were abandoned. Individual funds and their ups and downs can be seen at a glance and the entire movement is thus brought under review. By a convenient rearrangement the institutions controlled by the Metropolitan Asylums Board and the London County Council are now classified with other institutions serving the same purpose, so that all mental hospitals, all sanatoriums, and so on, are now under the same heading. Full particulars of the staff, altitude, climate, soil, and special facilities are now given for each sanatorium, collected from the answers to a questionary sent round to the medical superintendents. New entries give information about the Sunlight League, the Lord Mayor's Fund, Melbourne, the Brisbane and South Coast Hospitals Board, and the Hospitals Board Association of New Zealand. The section relating to provincial teaching hospitals has been expanded so that the personnel of these institutions appears in full. A new subsection is devoted to societies for providing legal aid. The Joint Council of the Order of St. John of Jerusalem in England and the British Red Cross Society has attained an importance which justifies its new place immediately after the King Edward's Hospital Fund.

[1] Burdett's Hospitals and Charities, 1928. Being the Year Book of Philanthropy and the Hospital Annual. Thirty-eighth year. London: Faber and Gwyer. Ltd., 24, Russell-square, W.C. Pp. 618. 21*s*.

PLAYING AT HEALTH.

IT has rightly been insisted that health must be presented to boys and girls as an attractive thing, worth gaining and keeping for its own sake. Too often in the past misguided enthusiasts have sought to frighten children into healthy ways by painting a dreary picture of disease, and there are still too many books on this subject which have not the proper outlook. Dr. J. Maxwell Taylor's recent volume, called "The Game of Health" (R. Gibson and Sons, Ltd. Glasgow. 1927. Pp. 79. 1*s*. 6*d*.), is not one of these and can be confidently recommended for young children either as a school reader or as a present for out-of-school hours. There is an introductory chapter on games which leads straight on to the main idea of the book in Chapter II. where the "health team" and the "disease team" are set out. The various members of these two sides are then dealt with in simple terms and the "playing field" is also discussed. The "strategy of the game" is the most important part of the book, and in it guidance on such matters as food, sunlight, sleep, posture, and clothing is presented in a clear and sensible way. The central idea is well developed, and if there is one small criticism of an otherwise excellent little book it is that the author has made no mention of the kidneys or sex organs which, with the ingenuity he obviously possesses, he could surely have worked into his scheme. The modest price should be noted.

A VITAMIN EXHIBIT.

AT the British Industries Fair, which is being held at the White City, Shepherd's Bush, till March 2nd, Messrs. Burroughs, Wellcome and Co. have an interesting exhibit of vitamin products, including "Tabloid" Irradiated Ergosterol, which finds its chief use as an addition to diets known to be deficient in vitamin D. A specimen of Vitamin A Concentrate is also displayed in a tube, the contents of which measure only four-fifths of an ounce. It presents the equivalent of vitamin A contained in 1 gallon of the finest quality cod-liver oil. With a view to demonstrate the space economy of tabloid products the contents of a "Tabloid" Outfit, measuring only a small fraction of a cubic foot, is contrasted with the equivalent contents in their ordinary or uncompressed state, with a capacity of nearly 23 cubic feet.

THE "CHARLOTTE" COVER.

THIS cover for the hot-water bottle has features which will recommend it for use with patients or children. For this reason it has received recommendation from medical men and from hospitals and nursing homes. It is a well-made bag of plushette, which exactly fits the indiarubber bottle for which it has been designed, while a cap, closely adjusted by studs, protects the stopper. Accidents certainly occur with some frequency through the employment of uncovered bottles, particularly where the patient is very young, or for various reasons unresponsive to pain; this is recognised by the employment of various methods of protection, of which the "Charlotte" cover seems a neat and improved example. The cover is supplied, pink or grey according to taste, by Messrs. C. J. Hewlett and Son, Ltd., Charlotte-street, London, in sizes from 8 in. by 6 in. to 12 in. by 10 in., the price varying accordingly from 19*s*. 6*d*. to 25*s*. per dozen.

A CHEAP RETINOSCOPY LAMP.

Dr. E. C. B. Ibotson (Corris, Merionethshire) writes: "There must be many like myself who live in districts where gas and electricity are not available, and who desire a cheap retinoscopy lamp. Most of those I have inquired about are not worth the price asked. I have rigged up accordingly an acetylene bicycle lamp with a carbon paper screen over the glass having a small central aperture. It works admirably."

QUEEN'S NURSES.—The name of Queen Victoria's Jubilee Institute for Nurses has been changed by Royal Charter to Queen's Institute of District Nursing; all future Queens are to be the patrons. The institute, which was incorporated by Royal Charter in 1889 to provide nursing for the sick poor in their own homes, now has 1400 nursing associations affiliated to it, and has under its supervision 6300 nurses and midwives, of whom 2700 are Queen's nurses. Last year these nurses attended three-quarters of a million cases and paid fifteen million visits.